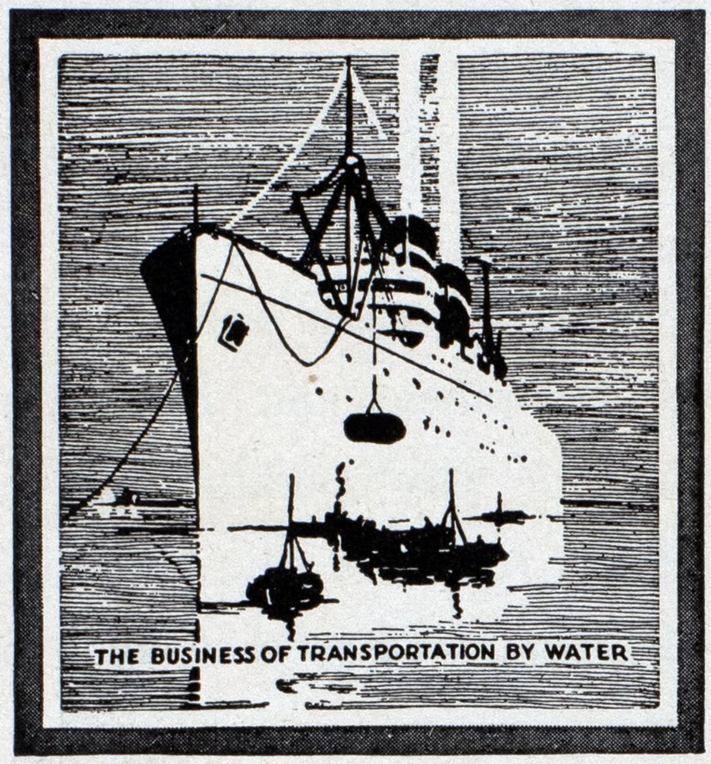
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Marine Review
March 1929



Chief Officer Harry Manning—Capt. George Fried—Rescue Ship S. S. America

Board Sells United States Lines

To Private Owners for Private Operation

Editorial

THE future success of the United States lines under private ownership and management will depend largely on the character and capacity of the men responsible for the purchase and the direction of its affairs after the government has relinquished control. It is fair to assume that in the month which elapsed between receiving the bids on Jan. 15 and the formal acceptance of the Chapman bid on Feb. 14 last, the United States shipping board made a thorough investigation of the responsibility and experience in shipping affairs of the successful bidder. Each bidder, it must be remembered was committed to the building of new ships.

Perhaps no individual, occupying, as he does, an outstanding position in American marine affairs through technical attainments, force of character and keen intelligence, has been so bitterly assailed on one hand and so extravagently lauded on the other, as a sort of superman, as William Francis Gibbs. The wide scope of his knowledge and his ability to state clearly the results of reasoning make it imperative that what he says should be given consideration.

His company in combination with two others had presented to the board the second highest bid which was $6,300,000 lower than the successful bid of $16,300,000. During the Senate inquiry into the proposed sale Mr. Gibbs gave to the committee of the Senate his analysis of the Chapman bid, noticeably impressing his audience with his grasp of the situation and the clarity of his views. The main conclusion of his analysis was that the Chapman bid was "economically unsound" and that it is not possible under this bid to make the United States lines a financial success. In attempting to prove this contention Mr. Gibbs painted a particularly gloomy picture of the prospects of a first class American transatlantic line in competition with foreign lines. Much definite information in the way of capital values, operating expense and anticipated maximum limits of possible gross revenue was given to the committee in Mr. Gibbs' analysis.

To be sure $6,300,000, the difference between the Chapman and the Gibbs' bid, is a large sum of money but as far as we can see, assuming equal ability in the two groups this is the only essential difference and it is not sufficient to warrant the conclusion of a successful American transatlantic line under the control of Gibbs and utter failure with a deficit of between $2,000,000 and $3,000,000 a year over the ten-year period of the bid under the sponsorship of Chapman, as predicted by Mr. Gibbs before the Senate committee. It seems that this is rather stretching it. Granted, for the sake of argument, that the $6,300,000 must be absorbed to put the two bidders on a parity as far as operation is concerned, at $2,000,000 a year this difference would be wiped out in three years and two months.

Everything that Mr. Gibbs said in regard to stiff competition with British, French, German and Italian lines as far as we can see is just as applicable had the Gibbs group been the successful bidder. The really serious part then of Gibbs' pessimistic picture of the future of the United States lines under Chapman management is in the possibility that the conduct of all the complicated and ramified affairs, including plans for new ships and possible reconditioning of old ships, will not be wisely and efficiently carried on. This is a serious matter, and like or dislike Gibbs as you may there is no denying his trained and intelligent appreciation of the difficulties to be overcome.

The American people are interested solely in the success of this venture. No one cares much about the battles between this group and that group for control. Even though Stanton had called Lincoln "that gorilla in the White House," he was appointed secretary of war because Lincoln was convinced that he was the best man in the nation to carry on the war to a successful conclusion. We therefore suggest that if Gibbs' plans and admitted ability are needed, and they may be, that the Chapman group take steps to avail themselves of his support. For one thing is certain, that a failure, a dismal failure, of the United States lines under private ownership and operation will be a serious blow to the revived interest Americans have taken in the proposition that our own ships should carry a fair proportion at least, of our great commerce.

Building Ships in Navy Yards

The cruiser bill, duly passed in congress and signed by President Coolidge on Feb. 13 provides for the laying down of five new cruisers during each of the fiscal years, 1929, 1930 and 1931 and the construction of one $19,000,000 aircraft carrier to be laid down in 1930. Since the bill was signed there has been some talk about a filibuster to kill the appropriation necessary to commence work on this program, the total cost of which is estimated to be $225,000,000. This attempt failed.

There is one extremely bad feature incorporated in the legislation authorizing the building of these cruisers and that is the Dallinger amendment that eight of the cruisers must be built in government navy yards without leaving it, as it should have been left, to the discretion of the secretary of war.

Navy yards must be maintained; that is obvious. They serve as bases for the repair and outfitting of the vessels of the navy in time of peace as well as war. If the navy yards are kept up in equipment and efficiently managed to take care of this primary reason for their existence the country will be well served.

It is not necessary from any point of view of preparedness to be able to build first class ships of war in the navy yards. Should war break out it would be impossible, or practically so, to pursue successfully the building of ships in navy yards. They would then be crowded to capacity in repairing and fitting out vessels of the fleet. Every facility that they might possess would be required to keep the fleet going and it would be extremely difficult to engage in building new ships.

It comes down to this. That the beginning and end of the Dallinger resolution is politics, politics of the kind where, you scratch my back and I'll scratch yours, is the main motive. It's a trade made presumably in the interests of those constituents of legislators who happen to live around a likely navy yard. On the other hand the very important fact of keeping our private shipyards going so that their personnel and equipment will be on an efficient basis is completely lost sight of.

Nothing can be of more importance to the nation as a matter of preparedness than the existence of an adequate number of highly organized, efficiently equipped private shipyards for the building of naval vessels as the necessity may arise, and just as important, for building modern merchant vessels equal to the best. This is essential, if we are to build up that ally of commerce and prosperity in peace time and that absolutely essential auxiliary of the navy in case of war, an efficient merchant marine.

Seamanship in Florida Rescue

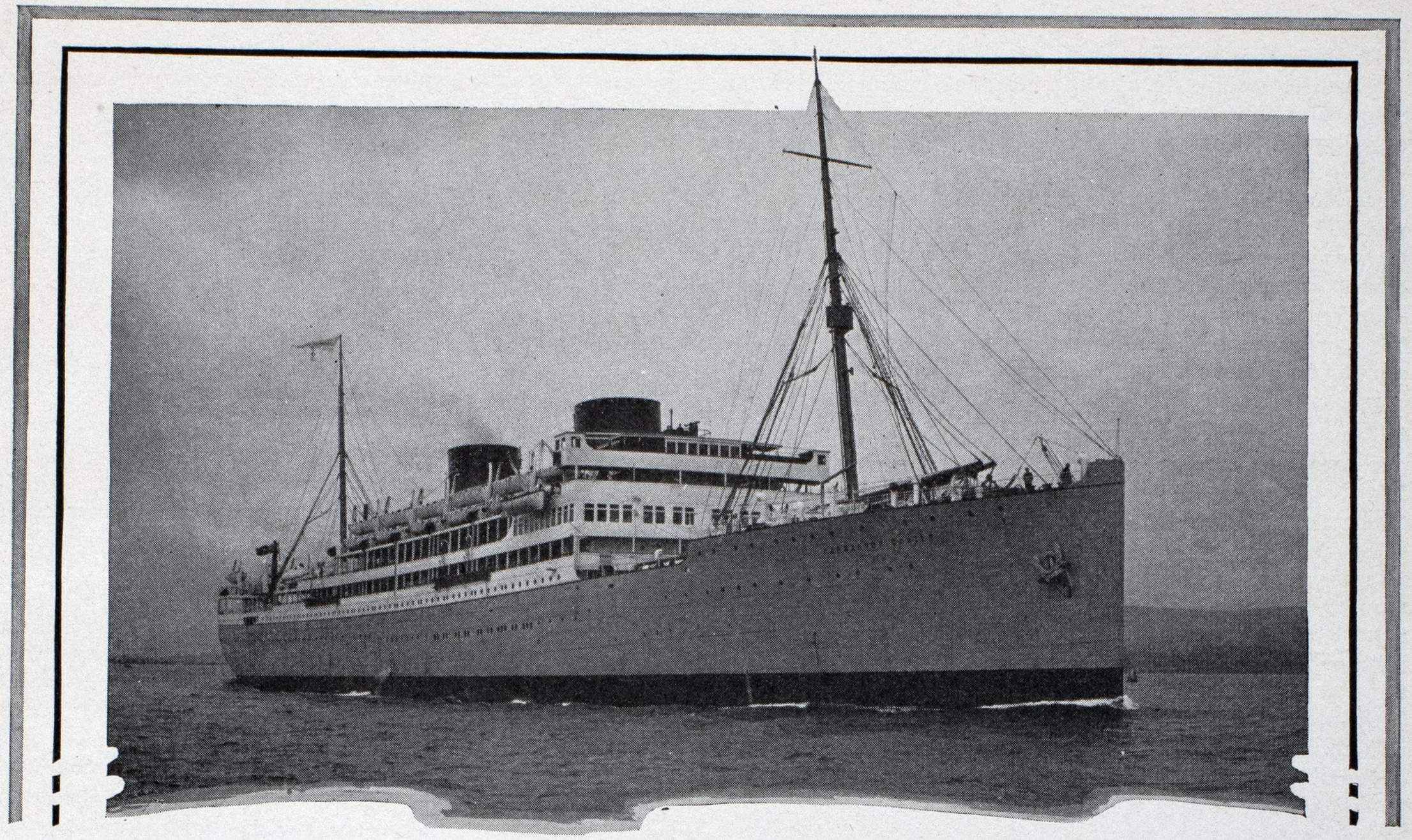
Again an American ship, entirely American officered and the crew mostly American citizens, has performed a difficult feat of rescue at sea. Almost to the day three years after his rescue of 25 of the crew of the British freighter ANTINOE, Capt. George Fried, commander of the United States liner, AMERICA, was fortunate enough to be able to report the successful rescue, "in a roaring gale," of all the crew, numbering 32, of the Italian freighter, FLORIDA.

This difficult feat of seamanship was carried out by Chief Officer Harry Manning with eight members of the crew, Junior Engineer, W. A. Clark; Boatswain's Mate, A. Wilson; Chief Storekeeper, S. Bracco (who acted as interpreter) Sailmaker, J. Palts; Quartermaster, W. Trettin, and F. Kellam and J. Harrobin, seamen and Master at Arms Waleck.

The FLORIDA was sighted at 6:30 p. m., Jan. 23. The daring rescue then proceeded. Great difficulty was experienced due to the seas and the extreme list of the freighter, her lee rail being under water. Chief Officer Manning maneuvered his lifeboat so that a line could be thrown on board keeping about 50 feet distant. One at a time the FLORIDA'S crew pulled themselves through the water to the lifeboat and were dragged on board.

The lifeboat loaded with 41 men, 9 members of the boat's crew and 32 rescued, headed for the AMERICA, the weather having by this time reached gale force with violent snow and rain squalls and high seas running.

Making due allowances for natural national pride this rescue demonstrates the high efficiency of personnel and equipment of this unit of a much patronized and widely criticized government owned and operated fleet. It shows that basically, ship for ship and man for man American sea heritage has been handed down unsullied to the present day. By removing the admittedly inefficient aspects of government ownership and operation and placing such ships and such men under the direction and initiative of private ownership, we can look forward with confidence to a virile and able merchant marine under the American flag.



Carnarvon Castle—First Diesel Liner to Sail to South Africa—20,063 Tons—Built by Harland & Wolff

British Build Up African Line

Government Mail Contracts Encouraged Private Service to South Africa—Growth from Sail to Giant Diesel Liners an Epic in Shipping

By E. J. Brown

EVEN the most indifferent and prosaic person cannot watch without emotion one of the modern giant liners, towering deck upon deck, with the band playing lively numbers, gay streamers flying, and rails black with passengers waving farewells as she leaves the wharf, bound for the other side of the world.

Surely then, 75 years ago, the mind of man would have reeled at the prospect of mammoth ships of the proportions of the 20,063-ton CARNARVON CASTLE making the long voyage from England to South Africa in less than 17 days. Such a masterpiece of the science of naval architecture would have seemed like a fantastic fairy tale; for before the year 1853, when no mail line existed, there were two little steamers of 179 tons each plying between England and the Cape only occasionally, and to these were entrusted what mail there was.

The dawn of 1853 heralded the foundation of the Union Steam Collier Co., afterwards renamed the Union line, which inaugurated the first regular mail service to South Africa. It was deemed a fine thing to see a brave ship setting forth upon a venture to such a distant land. At that time the company's fleet commenced operations in a very modest manner with five steamers the UNION, the SAXON, the BRITON, the DANE, and the NORMAN, whose aggregate tonnage totaled 2327, only two of these vessels exceeding 500 tons.



Lord Kylsant

Chairman, Union Castle Company

Four years later, the first mail contract between the Union line and the British government, for a period of five years, at an annual subsidy of £30,000, was signed and under this agreement the first ship, the DANE (530 tons) sailed from Southampton on Sept. 15, 1857, bound for the Cape of Good Hope. The largest vessel of the fleet was the ATHENS of 739 tons, which unfortunately foundered near Table bay in the year 1865, owing to a tremendous hurricane that caused the loss of many lives.

The time taken to negotiate the voyage between Capetown and Southampton was 42 days and this was considered a wonderful achievement. But as South Africa began to loom larger on the world's map, important

This article was written for MARINE REVIEW at the request of the editor. The author, E. J. Brown, is a resident of Johannesburg, South Africa.

developments inevitably took place.

In 1856, the title was altered to the Union Steamship Co. Ltd., and one year later an innovation was introduced which has continued ever since, namely, a call at St. Helena and Ascension, situated 760 miles northwest of St. Helena, for mails on the homeward voyages which, in 1866, included outward calls at St. Helena. This extra service was recognized by the government, which increased the annual subsidy to £33,000.

Postage on a letter from England to South Africa, just over 60 years ago, was a shilling per half-ounce. When the mail contract expired in 1862, the company's ships had fulfilled their obligations in such a satisfactory manner that a second was secured, and the voyage was cut down to 37 days.

Later, a contract was concluded with the Natal government for a seven years' mail service to Durban, to date from Oct. 1, 1865. Meanwhile, in the year 1864, activities began in other directions and the company extended its mail service to that extensively coral reefed island, taken from the French by the British in 1810, Mauritius.

Services Increased to Semimonthly

The rapid growth and development of South Africa in many channels led to a proposal for a semimonthly mail service between England and the Cape of Good Hope. This suggestion met with such general approval that a contract was signed in July, 1868, providing for two sailings per month to extend over a period of eight years.

Simultaneously with these significant changes, the growing requirements of mail, passenger and cargo traffic necessitated larger and faster ships. Soon there appeared the CAMBRAIAN of over 1000 tons, and as each of these "swift shuttles of an empire's loom" was built, the Union line increased the tonnage and engine power. Presently the ROMAN and the SAXON, each of 2100 tons, made their appearance, taking a period of 28 days for the voyage.

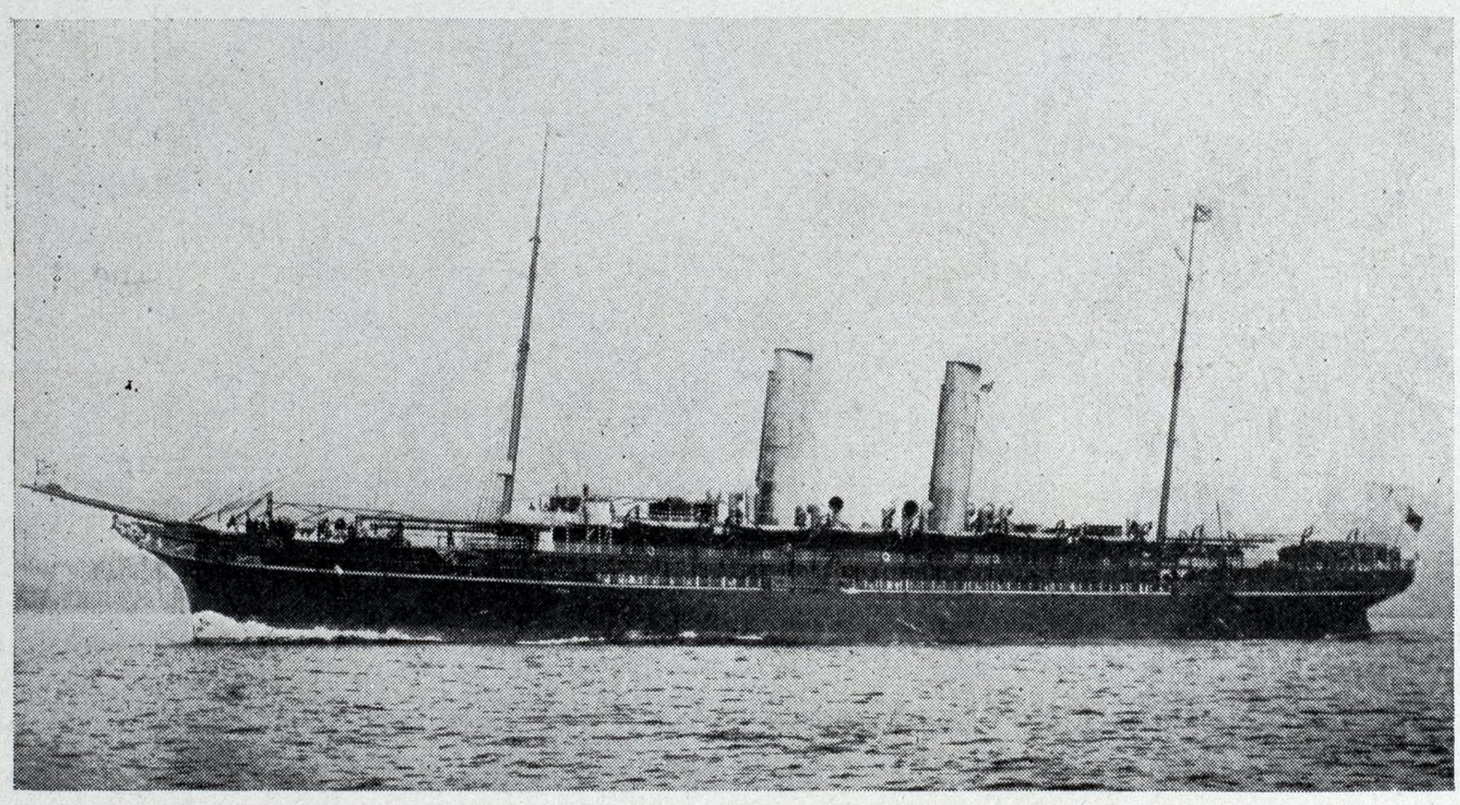
It would be impossible to relate the progressive and highly interesting history of the South African mail service without recalling the memorable and splendid work of the Castle line, once a friendly rival and later a partner of the Union company. The story of this line begins and ends with Sir Donald Currie, who was assuredly one of the most striking and romantic figures in the entire annals of British shipping. He was a gentleman noted for his public spiritedness and generous philanthropy.

Those were the days of picturesque sailing ships by which means the import trade of South Africa was largely provided for. After ten years' experience with this mode of transport, Donald Currie substituted steamers, and in 1871 he inaugurated a new and competitive service to the Cape with the ICELAND, the pioneer steamer of the Castle line, which sailed on her maiden voyage on Jan. 23, 1872. She was followed by a sister ship, the GOTHLAND, both vessels being of 1400 tons each. Even during this period of comparatively small ventures, Mr. Currie, as he then was, being a man of remarkable enterprise and foresight, had under construction the EDINBURGH CASTLE, WINDSOR CASTLE, WALMER CASTLE and DOVER CASTLE, a fleet of vessels which were then considered gallantly seaworthy and reliable.

It came to pass that when the contract with the Union line terminated, the new contract was divided equally between the two companies. The voyage time was reduced and in 1893 the postage, which had already fallen to fourpence per half-ounce, was now reduced to 2½ pence per half-ounce for letters, and the voyage was accomplished in 19 days. Because the limit today is 16 days 15 hours, the South African mails have earned the reputation for being the fastest schedule operating on any continuous voyage of equal length throughout the world.

Eventually, in the year 1900, the two competitors who had been fighting a clean and honorable fight for 28 years, amalgamated under the name of the Union-Castle Mail Steamship Co. Ltd., generally known as the Union-Castle Co., thus closing another chapter in the long, eventful history of the Merchant Service.

Several in our midst can still dwell with affection over memories such as the SCOT, the NORMAN, the PEMBROKE CASTLE and the ghosts of several others.



UNION STEAMSHIP CO.'S R. M. S. SCOT HOLDS RECORD FOR VOYAGE CAPETOWN TO PLYMOUTH—NOV. 23, 1892—13 DAYS, 23 HOURS, 19 MINUTES

Company Continues to Grow

The Castle line and the Union line linked up under the management of Messrs. Donald Currie and Co., while Sir Francis Evans, Bart., chairman of the Union company, also joined the firm. In the year 1907 he died, and his former opponent, Sir Donald Currie, followed him two years later. In 1912, Messrs. Donald Currie and Co. retired from the line, which was purchased by the Royal Mail Steam Packet Co., with Sir Owen Phillips, now Lord Kylsant, acting as chairman.

The Union-Castle Co. and South Africa have grown like two sturdy infants, side by side; the expansion and prosperity of the one has contributed to the expansion and prosperity of the other. Their progress has been mutual, interdependent, reciprocal. For this very reason, the company has kept on extending its fleet and keeping it in the front rank of live shipping policy.

The CARNARVON CASTLE and the WINDSOR CASTLE are magnificent examples of naval architecture and marine engineering. These vessels have established a reputation for luxury and comfort usually associated with the finest hotels.

In this outline no mention has so far been made of that avenue of the Union-Castle Co.'s activities which won and merited such conspicuous eulogy, yet this record would be incomplete without a hasty survey of the excellent service rendered by this fleet of ships during periods of warfare, of the victories which their crews have helped to win, of the manifold perils so heroically faced, of frightful battle incidents, of priva-

tions, of glorious deeds of valor, pluck and endurance, consummated by both officers and crews.

Right at the beginning of its life, the company was involved in the Crimean war, its fleet being chartered by the British and French governments for transport purposes.

Render Notable War Service

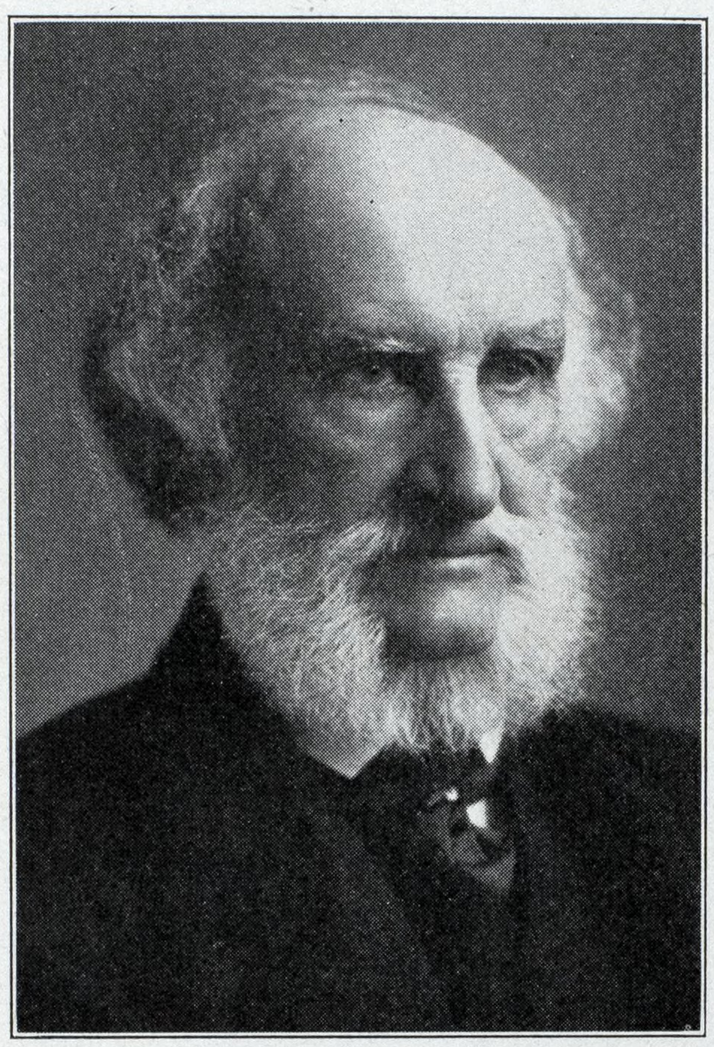
The Zulu war gave the Union line a further opportunity of distinguishing itself in the service of the Empire. It will be remembered how news of the disaster at Isandhlwana, together with an urgent request for reinforcements, was carried at full speed and thence forwarded by wire from the Cape Verde islands. Immediately on receipt of the news, troops were sent out from England and the situation in Zululand was saved.

It would take too long to recount the adventures of every vessel belonging to the company which enlisted during the Great war. One fairly typical illustration will suffice to show the magnificent bravery displayed by the officers and crew under the most terrible circumstances.

When the GALWAY CASTLE set out from Plymouth on Sept. 10, 1918, bound for the Cape of Good Hope, she was severely handicapped in several directions while making straight for the notorious danger zone at the Channel entrance. First of all, she carried not troops but passengers, including many women and children, quite unused to the discipline that warfare demands; and second, there were on board some 400 invalided South African soldiers, several totally blind, and others who were rendered helpless by severe wounds. Captain Dyer realized at the outset his great responsibilities with so mixed a company of 1000 souls.

Moreover, to add to the misfortunes that followed, the weather was particularly wild and the sea extremely rough, so that often the gallant ship found it quite impossible to proceed at a speed of more than six to seven knots. All went well until the hour of 7 a. m. on Sept. 12, when the ship was struck violently by a torpedo, resulting in a mighty explosion which shook the vessel from end to end, knocking men completely off their feet, and injuring the captain on the bridge. The explosion was so devastating that all lights below were extinguished, the wireless was incapacitated, and the engines were rendered useless. At once the vessel lost her way and groped about helplessly on the seething waters. The piercing shrieks of women and children made the situation all the more terrible. The second engineer and the men in the stokehold were killed. Water was pouring in a deluge into the engine room, soon flooding the cylinders.

Meanwhile, the damage to the GALWAY CASTLE was so serious that the ship was expected to sink at any moment. The captain gave orders for all boats to be lowered, but the evacuation of the ship could only be accomplished under the greatest difficulties, because the launching of boats in so heavy a sea was exceedingly perilous work. Eighteen out of the 21 boats were lowered, the other three were smashed to pieces. Even those successfully lowered were violently dashed against the ship's side and badly strained. One boat broke in half when it reached the water, precipitating women and children into the icy



LATE SIR DONALD CURRIE

Founder of Donald Currie & Co. and First Manager of the Castle Line

cold water. By this time, quantities of wreckage were floating about in all directions, which killed and injured many of those in the water who were struggling most pitifully against a raging sea.

Fine Record of Seamanship

Throughout this awful ordeal, the officers and crew behaved in accordance with the very highest traditions of their calling. Due to their staunch determination to place duty before all else, of the 1000 souls, only 150 were ultimately missing, a small number considering the herculean difficulties against which the valiant captain had to struggle.

The Union-Castle Co. has now served South Africa for more than 70 years. It is not surprising, therefore, that the rapidly increasing progress achieved in commerce and industry in this country received an early impetus in several instances from the company. For ten years, South African fruit was carried at a very small rate in the Union-Castle boats in order to encourage the trade. Anxious to encourage every form of industry in the colony, especially agriculture, farmers were granted the privilege of sending pedigree stock free of freight. Under these generous conditions, stock to the value of over £150,000 has been conveyed. Similarly, the first 2000 tons of Union grown cotton were carried without charge.

Co-operation With Shippers

An enormous amount of care and trouble was expended to make the farmers' tour an unqualified success. These farmers, drawn from all parts of South Africa, were the guests of the company throughout their itineraries to and from the United Kingdom. Throughout their extended tour, they were received at the principal well-known large farms in England and Scotland.

In conclusion, it must be emphasized that the prosperity of a nation, more especially one situated geographically like South Africa, depends greatly on its transport, and in this matter it is true to say that this colony is particularly fortunate in being served by a fleet of imposing ships, remarkably efficient in every direction. It is the general conviction that for the people of both countries, the Union-Castle Co. provides a link with home, whichever home it may chance to be.

Laid-up Steamer Is Sold

Sale of the S. S. KOSCIUSZKO to A. H. Bull & Co., New York, for the sum of $49,319 cash, was approved by the shipping board Feb. 21. Sale was authorized subject to an agreement that the purchasers will spend not less than $150,000 in reconditioning and bettering the vessel for ocean service. The betterments include the substitution of oil burning boilers for the present coal burners and the installation of accommodations for eight passengers.

The vessel, which is now laid up at New York, is a steel cargo ship of 7371 deadweight tons, equipped with reciprocating engines and scotch coal-burning boilers. She is designed to steam at 10 knots under ordinary weather conditions. The ship has been in lay-up since July, 1921.

Diesels Used in Foreign Ships

Recent Examples of European Application of Oil Engines in Passenger Ships, Freighters, Tankers and Trawlers—Electric Auxiliaries—Modern Equipment

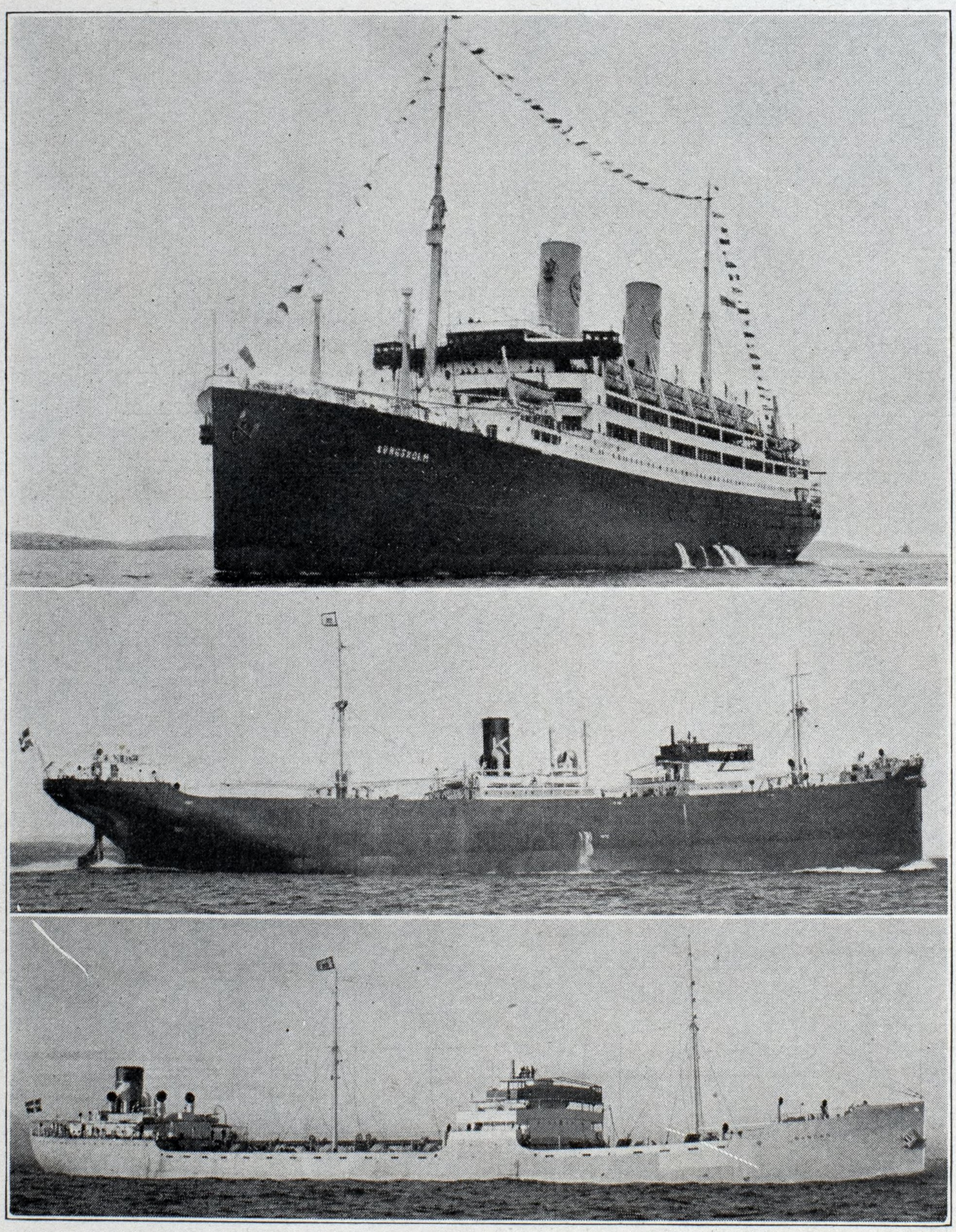
By A. H. Jansson

APPLICATION of the diesel engine to marine service in Europe is not confined to any particular class of ship. Ocean going ships for all services and practically in all sizes are being fitted with diesel engine drive. As a matter of useful information to American readers we give in this article a brief description of ten vessels built for European owners and all fitted with the diesel engines of one builder. Among the vessels described here are, two passenger ships, three freighters, four tankers and one trawler. The overall operating economy of all of these is high. The saving in fuel costs over that for similar size steamships is the chief item in the reduced cost of operation. This is based on the power involved and where the differential between fuel oil to burn under boilers and diesel fuel oil is not serious.

Passenger M.S. Kungsholm

A TWIN screw diesel passenger liner for the transatlantic service of the Swedish American line, built by Blohm & Voss, Hamburg, similar in general features to the GRIPSHOLM. General dimensions are: Length overall, 608 feet 4 inches; breadth molded, 78 feet 1 inch; depth to D deck, 42 feet 6 inches; displacement, 26,000 tons. Passenger accommodations 1600 in three classes. The propelling machinery consists of two 8-cylinder, double acting, 4-cycle Burmeister & Wain diesel engines built in that company's shops in Copenhagen. Total indicated horsepower is 18,000 for the two engines, or 15,000 shaft horsepower, at 100 revolutions per minute. At 120 revolutions per minute the total capacity of the two main engines is increased to 20,000 indicated horsepower. The main engines as well as the compressor engines and the diesel generators are fully balanced to eliminate vibration.

This vessel sailed from Gothenburg to New York on Nov. 24, last year and arrived in New York on Dec. 3. On Dec. 1, of that voyage a distance of 453 miles was logged under smooth to moderate sea conditions with 102 mean revolutions per minute of the engines, the ship attaining a mean speed of 18.3 knots. This was the top speed for the voyage. The mean speed on the trial trip was 18.06 knots.



UPPER—TWIN SCREW DIESEL TRANSATLANTIC LINER KUNGSHOLM. MIDDLE—SINGLE SCREW DIESEL CARGO SHIP SLEMMESTAD. LOWER—TWIN SCREW DIESEL TANKER SANDAR

Freighter Slemmestad

A HIGH class, modern single screw, diesel cargo ship, built for A. F. Klaveness & Co., Oslo by Burmeister & Wain. She is of the open shelter deck type with poop and forecastle, and is built to the highest class in the Norwegian Veritas. Her principal dimensions are: Length overall, 394 feet; length between perpendiculars, 375 feet; breadth molded, 53 feet 6 inches; depth molded to shelter deck, 36 feet; depth molded to upper deck, 27 feet; deadweight capacity, 7750 tons; gross tonnage, 4301.

Keeping in mind the dimensions and carrying capacity of this ship it is interestiing to note that the propelling machinery consists of one 6-cylinder, 4-cycle, single acting Burmeister & Wain diesel engine of crosshead type developing 3000 indicated horsepower at 100 revolutions per minute. Estimated service speed is 11½ knots, though during the trial trip on Sept. 1, 1928, with the engine developing 3301 indicated

horsepower at 107 revolutions per minute, a speed of 14 knots was attained. On the trial trip the fuel oil consumption was 135.4 grams (.30 pound) per indicated horsepower per hour for all purposes. The daily fuel consumption is about 10 tons, which, with a bunker capacity of 1100 tons, will give this freighter a sailing radius of 30,000 miles.

Diesel Tanker Sandar

THE SANDAR is a twin screw diesel tanker. She was built at the yard of Burmeister & Wain at Copenhagen for Norwegian owners. The vessel conforms to Lloyd's highest class and to the society's special survey. The principal dimensions are: Length overall, 470 feet, 8 inches; length between perpendiculars, 450 feet; breadth molded, 59 feet; depth molded, 34 feet; draft loaded, 25 feet 9 inches. The deadweight capacity on this draft is about 11,150 tons. Gross tonnage is 7634; net tonnage, 4549.

The hull is built on the Isherwood bracketless system and is divided into 2 x 9 center tanks and 5 summer tanks at each side. Of the total cargo capacity of 525,600 cubic feet, 462,900 cubic feet is the capacity of the main tanks and 62,700 cubic feet is the capacity of the summer tanks. Forward of the cargo tanks there is cargo space with a capacity of 26,500 cubic feet in the hold and 14,000 cubic feet on the 'tween deck.

The propelling machinery is comprised of two sets of 6-cylinder, 4-cycle, single acting diesel engines of Burmeister & Wain latest trunk piston type. The combined output of two engines is 4200 indicated horsepower at 145 revolutions per minute. With this power, in service, the ship will do 11½ knots loaded.

On a speed trial held in the sound at Copenhagen, Dec. 1928 a speed of 12.22 knots was attained over the measured mile. Two engines developed 4165 indicated horsepower at 144 revolutions per minute. A fuel consumption test over a period of four hours with the main engines developing 4290 indicated horsepower gave a mean fuel oil consumption of 141.5 grams (.312 pound) per indicated horsepower per hour for all purposes.

Freighter Fernmoor

THE motorship FERNMOOR might be termed the peak of modern high class cargo vessel construction. On her trial run she developed a speed of over 15½ knots. All of her auxiliary machinery in the engine room as well as on deck is electrically driven. She is a twin screw vessel, built and engined by Burmeister & Wain, to the highest class in Norwegian Veritas for Norwegian owners. Her principal dimensions are: Length between perpendiculars, 380 feet; breadth molded, 53 feet 6 inches; depth molded to shelter deck, 36 feet; depth molded to main deck, 27 feet 6 inches; height of double bottom 3 feet 10 inches; capacity of cargo holds is 458,300 cubic feet; draft loaded, 24 feet 8 inches; deadweight capacity, 7760 tons; gross tonnage, 4276.5; net tonnage, 2497.7.

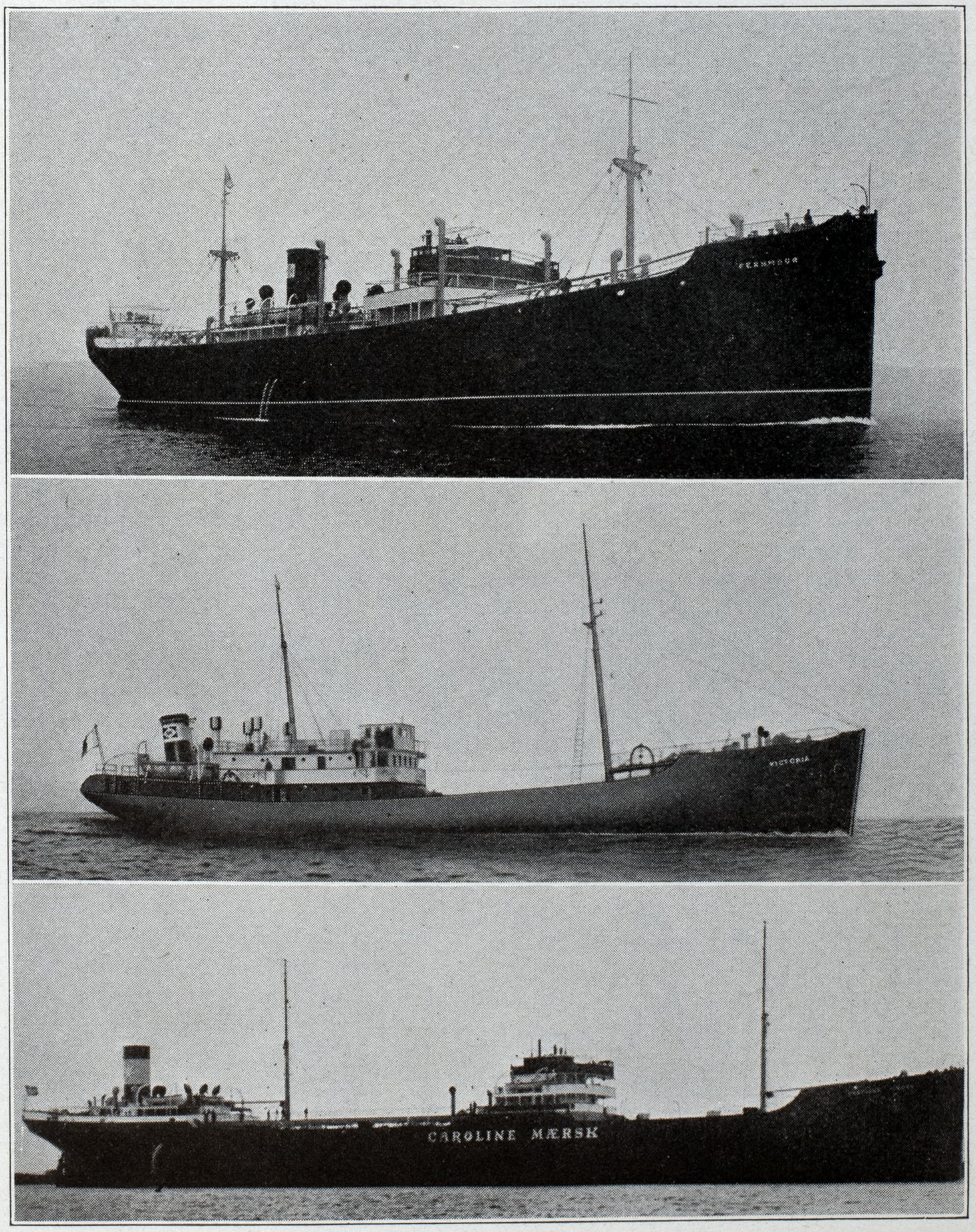
This vessel has two complete steel decks, five hatches and six watertight bulkheads dividing the ship into five compartments, that is, engine room, and two cargo holds forward and two cargo holds aft. Fuel oil capacity in the double bottom is about 1250 tons. The vessel is completely equipped with electrically driven winches for cargo handling.

Propelling machinery consists of two 6-cylinder, 4-cycle single acting, forced lubricated, direct reversible, Burmeister & Wain diesel engines, of latest trunk type, developing a total of about 3800 indicated horsepower at 140 revolutions per minute. Sea speed of the ship loaded is 13 knots.

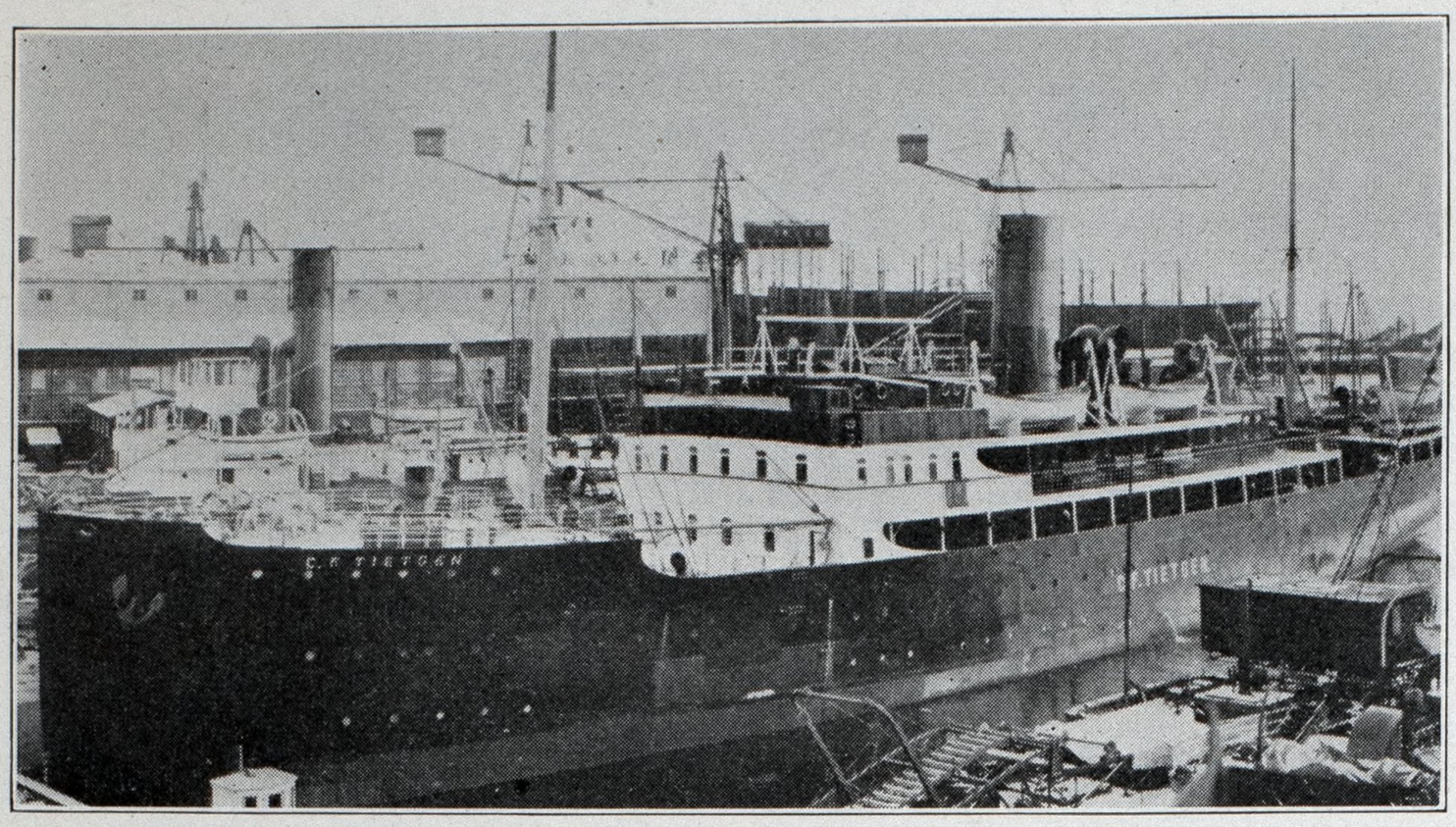
On the trial trip in the Sound at Copenhagen on Dec. 21, 1928, a speed of 15.54 knots was attained over the measured mile, the main engines developing a total of 4526 indicated horsepower at 149.2 revolutions per minute. The trial was successful in every respect.

Diesel Trawler Victoria

THE single screw diesel trawler, VICTORIA was built by Burmeister & Wain for the Societe Nouvelle des Pecheries a Vapeur, Arcachon, France, to the highest class in the Bureau Veritas and to that society's special Length overall, 208 feet 8 inches;



UPPER—TWIN SCREW DIESEL CARGO SHIP FERNMOOR. SINGLE SCREW DIESEL TRAWLER VICTORIA. TWIN SCREW DIESEL TANKER CAROLINE MAERSK



SINGLE SCREW DIESEL PASSENGER SHIP C. F. TIETGEN

Length over all, 208 feet 8 inches; length between perpendiculars, 195 feet; molded breadth, 32 feet 9½ inches; depth to main deck, 18 feet 7¼ inches; draft loaded, 17 feet 2¼ inches; deadweight capacity, 1075 tons; capacity of fish cargo, 32,500 cubic feet.

Propelling machinery of this diesel trawler is one 6-cylinder 4-cycle, single acting, Burmeister & Wain diesel engine of the trunk piston type developing about 1000 indicated horsepower at 150 to 155 revolutions per minute. The revolutions may be reduced to one-fourth without any difficulty. On the trial trip of the trawler, VICTORIA, Jan. 13, 1928, with a mean draft of 11 feet 10 inches, a speed of 11.93 knots was attained over the measured mile, the engine developing 1248 indicated horsepower at 166.9 revolutions per minute. A consumption test over a period of two hours at 165.8 revolutions per minute gave a mean fuel consumption of 133.8 grams (.30 pound) per indicated horsepower per hour for all purposes.

Service speed of the trawler is 11¼ knots. Comparing the VICTORIA with a similar dimensioned steam trawler there is a striking increase in cubic and deadweight capacity and also in speed. The crusing radius of 25,000 miles due to small fuel oil consumption is also a distinct advantage on long voyages to the Newfoundland banks and other distant fishing grounds.



UPPER—TWIN SCREW DIESEL TANKER HIDLEFJORD. LOWER—SINGLE SCREW DIESEL CARGO SHIP YANDRA

Tanker Caroline Maersk

BUILT by the Odense Steel Shipyard, Odense, Denmark, the twin screw diesel tanker CAROLINE MAERSK was given her sea trials on Nov. 15, 1928 in the Kattegat. This tanker was built to the highest class in Lloyd's for Danish owners. Her dimensions are: Length overall, 479 feet 2 inches; length between perpendiculars, 456 feet; breadth molded, 59 feet 6 inches; depth molded, 35 feet 9 inches; draft with summer freeboard, 26 feet 8 inches; and corresponding deadweight, 11,800 tons. The hull is built on the Isherwood bracketless system with two longitudinal bulkheads going through all cargo tanks. There are nine main tanks and ten side tanks. The main deck is continuous. Additional decks are forecastle bridge and long poop.

In the pump room amidship there are two duplex steam cargo oil pumps of a total capactiy of 650 tons per hour. The pumps are operated by steam supplied by two scotch boilers with a total heating surface of 2600 square feet. These boilers are located aft in the engine room and also supply steam for pumps in the forward pump room, winches, windlass, heating coils and to the fire extinguishing system.

Power for propulsion in supplied by two, 4-cycle single acting, direct reversible Burmeister & Wain diesel engines. These engines are of latest design, with six cylinders, developing in both engines together a total of 3440 indicated horsepower with superchargers at 145 revolutions per minute. A service speed of 11 knots is possible with this power.

On the trial trip of the CAROLINE MAERSK a speed of 11.4 knots was attained over the measured mile with a total of 3274 indicated horsepower, at 141 revolutions per minute, for the two engines combined. It was estimated that a current of about 2 knots strength was running. A test lasting three hours was run to establish the fuel consumption. It was found for a total indicated horsepower of 3333 that the fuel oil consumption amounted to 138.18 grams (.305 pound) per indicated horsepower per hour for all purposes. The trial trip was successful in every way.

Tanker Hidlefjord

ANOTHER large twin screw diesel tanker the HIDLEFJORD was completed during the latter half of last year by Burmeister & Wain for Norwegian owners and in accordance with specifications from the Anglo Saxon Oil Co. This tanker is built to Lloyd's highest class and under that society's special survey. Her principal dimensions are: Length overall, 470 feet 8 inches; length between perpendiculars, 450 feet; breadth molded, 59 feet; depth to main deck, 34 feet; draft loaded, 25 feet 8½ inches; deadweight, 11,050 tons; gross tonnage, 7639; net tonnage, 4489.

The hull is built on the Isherwood bracketless system and is divided into 2 x 9 center tanks and 5 summer tanks on each side. The total cargo capacity is about 525,000 cubic feet of which 62,700 cubic feet is carried in the summer tanks. As in the other tanker described there is a general cargo space of about 27,000 cubic feet and 14,500 cubic feet capacity respectively in the hold and 'tween deck. Fuel oil capacity is about 930 tons which gives the vessel a cruising radius of 18,000 miles.

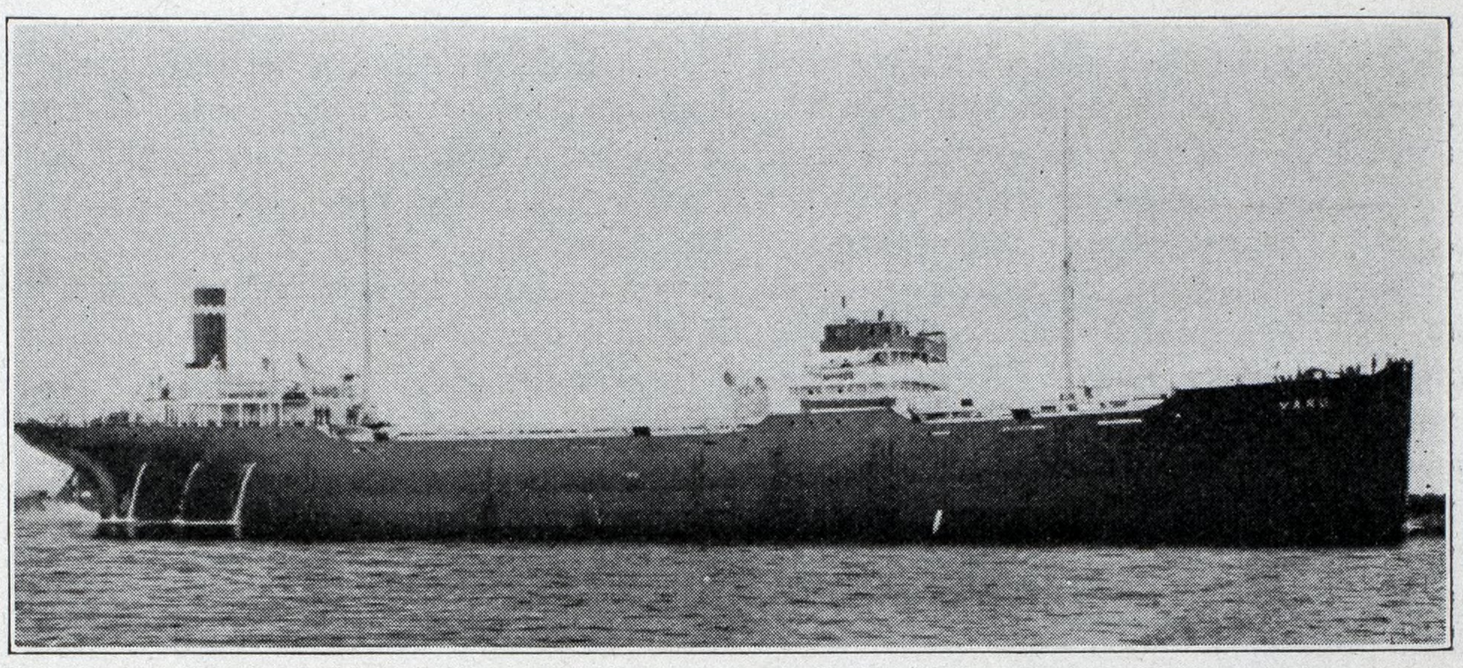
Crew accommodations are spacious and well ventilated in keeping with the Norwegian laws. The engine room officers are quartered in the deck house on the poop while deck officers and the captain are located amidships.

Propelling machinery consists of two sets, 6-cylinder, 4-cycle single acting Burmeister & Wain diesel engines of recent design. The combined output of the two engines is 4200 indicated horsepower at 135 revolutions per minute. Service speed for this horsepower in loaded condition is 11½ knots. All of the auxiliary machinery in the engine room is electrically driven while the deck machinery is steam driven. There are two diesel engine generating units of 100 brake horsepower each at 400 revolutions per minute each direct coupled to a 66-kilowatt dynamo and auxiliary compressor. Steam is supplied by two oil fired scotch cylindrical boilers located on a platform deck at the after end of the engine room. Each boiler has a heating surface of 1200 square feet and the working pressure is 180 pounds per square inch.

Trials of the twin screw diesel tanker, HIDLFEJORD took place outside of Copenhagen, Aug. 25, 1928. The fuel oil consumption per indicated horsepower per hour with the two main engines developing a total of 4052 indicated horsepower was found to be 138.7 grams (0.306 pound) for all purposes. A speed of 12.2 knots was attained with the engines developing 4268 indicated horsepower at 134 revolutions per minute. After completion of the trials the HIDLEFJORD proceeded immediately on her maiden voyage for America.

Pass. Ship C. F. Tietgen

A SINGLE screw passenger diesel ship, the C. F. TIETGEN was completed toward the end of last year by the Elsinore Shipbuilding & Engineering Co. Ltd., for the service between Copenhagen and Jutland of the United Steamship Co. Ltd. It is of special note that this is the first installation of a large marine diesel engine of the airless injection type built by Burmeister & Wain. The completed vessel is modern throughout to meet the critical demands for this important coastal service.



SINGLE SCREW DIESEL TANKER VARG

The keel was laid on July 9, launching took place on Oct. 20 and she was taken over by her owner, fully equipped and finished for sea on Dec. 15, 1928. The principal dimensions are: Length between perpendiculars, 270 feet; beam overall, 40 feet 11 inches; depth to awning deck, 24 feet 6 inches; draft loaded, 15 feet 9 inches ; displacement, 2685 tons; gross tonnage, 1850; net tonnage, 1037; deadweight, 900 tons; cargo capacity, 51,500 cubic feet. There are three decks designated as awning, main and 'tween decks.

For handling cargo five powerful electric winches have been fitted. In addition to ordinary cargo hatches there are large 'tween deck cargo openings in the ship's side. Automobiles are carried on the after main deck.

Accommodations have been arranged in saloons and cabins to take care of 173 first, 109 second and 293 third class passengers. Public rooms for first class passengers are located on the awning deck amidships. There is a vestibule, smoking room, dining room and a smaller lounge between these. The cabins are all for one or two passengers and are fitted with beds. Passenger accommodations are properly ventilated both in warm and cold weather.

Propulsion is by means of one 8-cylinder, 4-cycle, single acting, direct reversible, diesel engine of Burmeister & Wain's latest design of trunk piston type with airless injection. The main engine develops about 2200 indicated horsepower corresponding to 1850 shaft horsepower at 140 revolutions per minute. It is interesting to note that the engine is designed to operate with supercharger when extra power is required. For this purpose there is installed an electric driven centrifugal supercharger for delivery of the blast air of sufficient size to increase the output of the main engine to 2450 indicated horsepower at 145 revolutions per minute.

The C. F. TIETGEN was given her sea trial on Dec. 15, 1928, in the Sound outside Elsinore. She left port at 9 o'clock in the morning returning again at 4:30 in the afternoon. Technical experts from Danish, Norwegian, British and Japanese shipping companies attended the trial. A maximum output of 2630 indicated horsepower at 150.1 revolutions per minute was obtained. The vessel entered regular service on Dec. 20.

Diesel Freighter Yandra

THE motorship, YANDRA, single screw cargo vessel, was built by Burmeister & Wain for the Adelaide Steamship Co., Adelaide, Australia, to that company's requirements and under special survey to Lloyd's classification and in conformity with the rules of the board of trade and the Australian law.

She is of the raised quarter deck type with cruiser stern. The prin-

cipal dimensions are: Length overall, 218 feet 3 inches; length between perpendiculars, 210 feet; breadth molded, 35 feet; depth molded to main deck, 13 feet 9 inches, and to raised quarter deck, 17 feet 3 inches; deadweight, 1025 tons; gross tonnage about 990. There are two cargo holds with engine room amidships. The total cargo capacity of the holds is 55,200 cubic feet of grain or 52,000 cubic feet of bales. Special attention was given to cargo handling facilities suitable for coastal service.

Quarters are provided for deck and engineer officers in the bridge erections. The dining saloon is located in front of the engine casing and the captain's room and three staterooms are located on the bridge deck. Crew quarters are in the poop with separate mess room for seamen and motormen.

The main engine is one, 6-cylinder, 4-cycle, single acting Burmeister & Wain, trunk piston type diesel engine. At 125 revolutions per minute the engine develops 1300 indicated horsepower giving the ship a service sea speed of nearly 12 knots With full fuel oil tanks the YANDRA has a cruising radius of 17,000 miles. This is ample for the voyage, for instance, from Denmark to Australia.

Trials of the YANDRA were held near Copenhagen Aug. 30, 1928. The vessel was loaded down to her marks with sand. Fuel oil consumption was determined during a three-hour test. With the main engine developing 1306 indicated horsepower the fuel oil consumption was 138.1 grams (0.305 pound) per indicated horsepower per hour, for all purposes. A speed of 11.76 knots with mean draft 12 feet 5¼ inches was observed, the main engine developing 1295 indicated horsepower at 162.6 revolutions per minute. After the trials the vessel sailed for Australia via England.

Diesel Tanker Varg

THE single screw diesel tanker VARG, built by the Odense Steel Shipyard, Odense, Denmark for Norwegian owners, was given her trials in the Kattegat on Aug. 22, 1928. Her principal dimensions are: Length overall, 411 feet; length between perpendiculars, 389 feet 6 inches; breadth molded, 55 feet; depth molded, 30 feet 8 inches; draft with summer free board, 24 feet 10¾ inches; corresponding deadweight, 8260 tons. This vessel is built to the highest class in Lloyd's and her construction is on the Foster King system with two longitudinal bulkheads extending through all the cargo tanks. There are four main tanks and four side tanks aft of the pump room and four main tanks forward of the pump room. There is one main deck throughout and forecastle bridge and poop decks. Above all the main tanks there is a trunk 18 feet wide by 4 feet 9 inches high running from forecastle to poop.

Quarters for captain, deck officers, doctor, wireless operator, pilot, steward and hospital are in the deck houses on the bridge. The engineer, officers and the crew are quartered aft.

For cargo pumping there is fitted in the pump room amidships three duplex cargo oil pumps with a total capacity of about 785 tons per hour. The pumps receive steam from two oil fired boilers with 2300 square feet of heating surface. These boilers also supply steam for the windlass and the cargo winch. The steering gear however, is electrically driven.

The propelling machinery is located aft and consists of one 6-cylinder, single acting, 4-cycle reversible Burmeister & Wain diesel engine of standard type. At 105 revolutions per minute this engine develops 3000 indicated horsepower.

A speed of 12.21 knots was attained on the trial trip of the diesel tanker VARG which took place on Aug. 22, 1928 in the Kattegat. When making this speed the main engine developed 3036 indicated horsepower at 107.2 revolutions per minute. The fuel oil consumption was determined during a 3¾-hour test. During this test the main engine developed 3002 indicated horsepower and the fuel oil consumption was 136.6 grams (0.301 pound) per indicated horsepower per hour, for all purposes. After the completion of the trial the ship was formally taken over by her owner, Leif Hoegh of Oslo. The VARG was immediately dispatched on her maiden voyage to load gasoline at the Gulf for Oslo.

Combustible Gas Can Now Be Detected

AN IMPORTANT problem confronting owners and operators of oil tankers, oil burning steamships, drydocks and ship repair yards is the ever present possibility of undetected, explosive mixtures of oil vapor and air existing in and about oil compartments and fuel tanks. This is an especially vital consideration when some form of hot repair work, or work liable to emit sparks, is required on such compartments or tanks.

Although the tanks upon which work is to be done may have been thoroughly steamed and aired, and a chemist's certificate indicating that they are safe for men and fire may have been issued, there is no assurance that an atmosphere, free of gas at the time a sample was taken for analysis, continues gas-free during the repair period. An increase in temperature due to the weather or to hot work, or possibly to the bodily heat of the workmen, may cause a volatilization of a slight amount of oil remaining in some part of the tank. In order to be on the safe side, it would be necessary for a chemist to be present to take frequent samples of the atmosphere while work is in progress and have them immediately analyzed. This procedure would not only be expensive, but very inconvenient, since the chemist's analysis is usually made in a laboratory, and at best, cannot be made instantaneously.

How Detector Is Operated

A definite need for a simple, portable, gas-testing instrument that would indicate, immediately and accurately, atmospheric conditions within oil tanks or compartments has long been recognized by shipping officials and marine repair men.

Such an instrument, originally developed by the engineers of the Union Carbide and Carbon Research Laboratories, Inc., as a methane indicating detector for the detection of methane, or "firedamp," has recently been adapted to industrial use. Its primary use was in coal mines and it has received the approval of the United States bureau of mines as permissible equipment for use in methane and air mixtures. It has been found to be equally effective for the detection of a wide range of combustible gases encountered in the marine field.

This combustible gas indicator utilizes the effect of combustion of flammable gas and air mixtures on the surface of a heated filament. Combustion increases the temperature, and consequently the electrical resistance, of the filament. This change in resistance causes the needle of a meter to move over a scale, from which the desired readings relative to gas conditions are obtained.

The instrument consists essentially of three parts; detector head or com-

bustion chamber, meter case and portable storage battery.

The detector head consists of a cylindrical meter case, or bonnet, which screws on a metal base equipped with a short carrying handle. The bonnet is provided with louvres, or small openings, which permit gas and air mixtures to circulate about the heated filament. Within the bonnet are three concentric gauze screens, of a type similar to those used in flame safety lamps, which prevent the ignition of external gas and air mixtures. In the center of the chamber formed by these screens is the filament cartridge. The detector head is so constructed that accidental incorrect assembly of safety screens and filament cartridge renders it inoperative.

A flexible twin-conductor cable about 50 feet long connects the detector with the meter case. The meter case contains the various resistances in the detector circuit, the indicating meter, the control switch and a rheostat. A short flexible conductor connects the meter case to the portable storage battery, which supplies the power to operate the Indicator.

Can be Carried About

The storage battery is carried on a leather belt worn around the waist. To this belt are hooked the detector head and the coiled cable. The meter case is carried by a light strap around the operator's neck or it may be hooked to the leather battery belt if so desired. The entire outfit is compactly stowed in a carrying case from which it may be operated without removing the meter and battery.

The indicator is made ready for operation by throwing the control switch first to the "filament" position, then a few seconds later to the "meter" position. Zero adjustment in fresh air is next made by turning the rheostat knob. The operator then places the detector head in the atmosphere to be tested and reads the meter. The detector head may be held in the hand, raised vertically, extended horizontally, or lowered into a manhole, tank, or elsewhere.

The scale is of a type that will make the instrument equally useful to the average workman or the industrial chemist and safety engineer.

Given Per Cent Combustible

For the operator who desires to know the amount in per cent of a known combustible gas present in a mixture of that gas and air, the meter scale reading is taken and then referred to the particular curve or chart prepared for that gas. From the curve chart the operator reads the per cent of gas present corresponding to the scale reading of the meter. The gas charts are plotted with meter scale reading as the horizontal axis and the per cent of gas as the vertical axis.

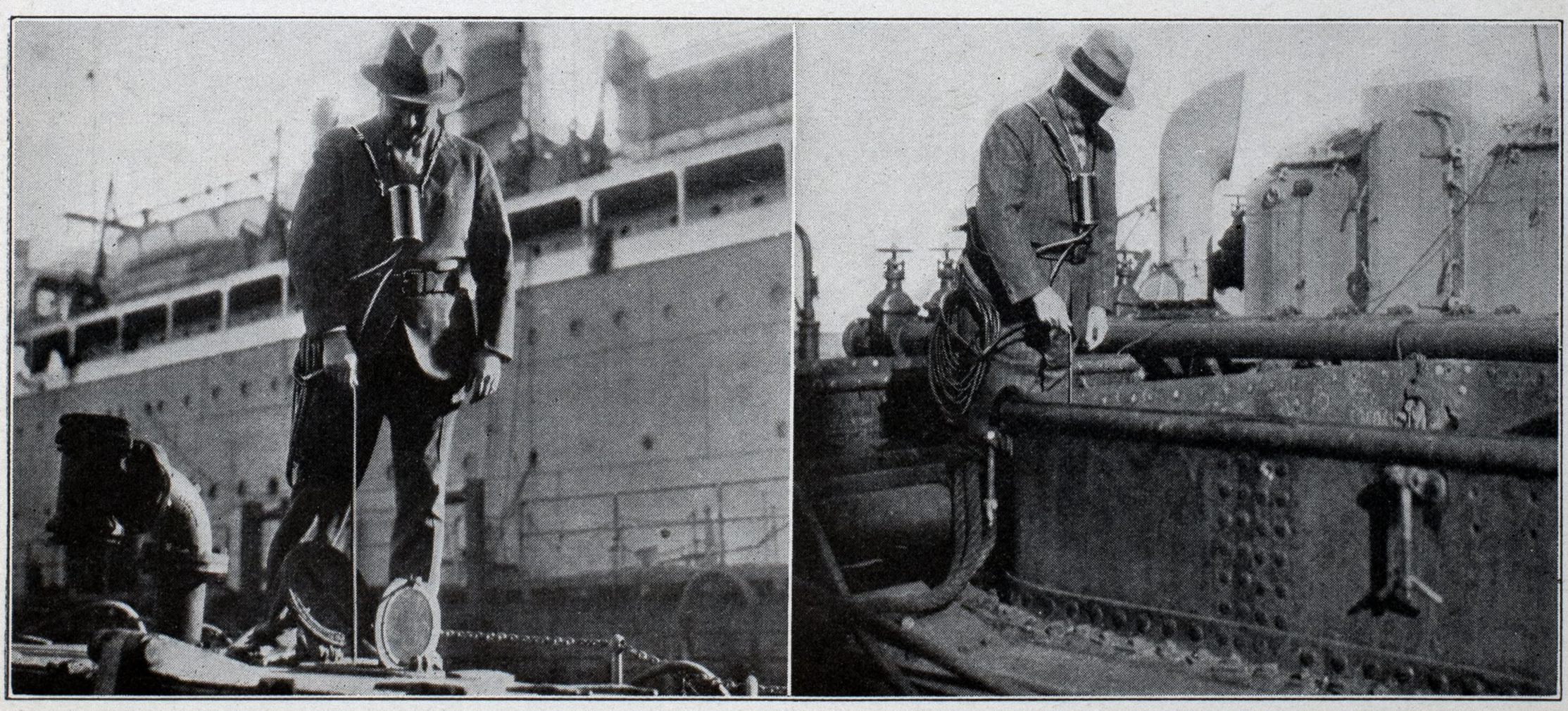
If an unknown mixture of flammable gases exists and the operator desires to know whether or not the mixture is explosive, the meter scale reading is taken and referred to a per-cent-of-explosibility curve.

Especially for those concerned with gas testing in and about oil tankers, oil and gasoline storage tanks, tank cars, oil refineries, etc., the scale is also divided into a white section and a red section. If the meter needle comes to rest anywhere in the red section an atmosphere containing 0.2 per cent or more of combustible gas (expressed as pentane vapor) is indicated showing that the atmosphere is unsafe to breathe without gas masks and unsafe for any work that requires heat or fire, or is liable to emit sparks.

If the meter needle comes to rest in the white section of the scale, less than the equivalent of 0.2 per cent pentane is present and hot repair work may be done provided all other regulations and precautionary measures have been followed. However, even though the needle comes to rest in the white section the atmosphere may not be safe to breathe without gas masks as small amounts of extremely poisonous gases such as hydrogen sulphide, etc., may be present. Under these conditions the determination of whether or not gas masks should be worn must be made by other methods as this instrument is designed to indicate the flammability of gases rather than the toxicity of small quantities of poisonous gases.

Eliminates Laboratory Analysis

Some of the important features claimed by the manufacturers of gas indicator are as follow: Sampling and laboratory analysis are eliminated. Immediate and accurate indications eliminate guesswork. Explosive mixtures of gas and air are vividly indicated by continual oscillation of the meter needle. Continuous observations may be made while men are working in gaseous atmospheres, and warning given when gas content approaches dangerous limits. All accessible parts of tanks or compartments can be thoroughly tested for gas pockets. The detector head may be lowered into a tank while the operator remains outside. The entire outfit is safe to operate in all gas-air mixtures, except those containing acetylene or hydrogen.



TESTING FOR COMBUSTIBLE VAPOR IN THE COMPARTMENTS OF AN OIL TANKER UNDERGOING REPAIRS

Operating Costs Are Cut in Half

Diesel Electric Ferries in Service Two Years on Hudson Prove Economical—Low Fuel Cost—Much Cheaper to Operate than Steam

SHIPPING men are inclined to be conservative. They are not easily moved from their allegiance to types of machinery and to methods that on the whole, in practice, have proved satisfactory. Two and one half years ago when Carroll D. Winslow organized the Electric Ferries Inc. and proposed a radical departure in the machinery and the general layout of the ferries to be employed the average shipping man familiar with service conditions on the Hudson river was not optimistic of the outcome. Operating results however for the last two years more than bear out the anticipations of Mr. Winslow and his technical advisors.

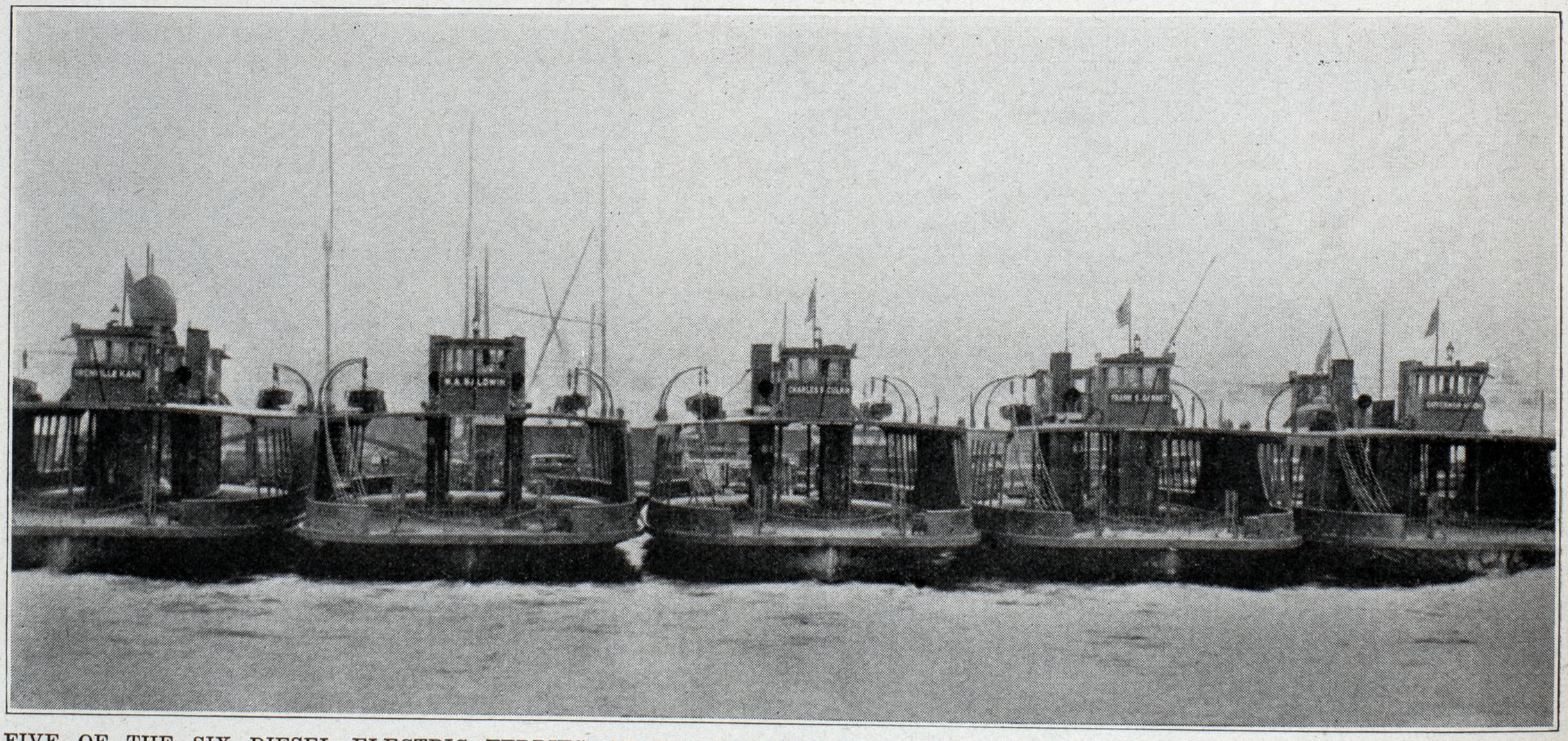
Actual operating figures over a long period, in winter and summer, show that the total operating cost for crew fuel and lubricating oil for one of these ferries is $5 per hour whereas a conservative figure taken from actual operating results for a similar size steam ferry boat will be $12 per hour or nearly two and one half times as much. The diesel electric ferry operates on 20 gallons of diesel fuel oil and ½ gallon of lubricating oil per hour. This means $1.20 for fuel and 30 cents for lubricating oil per hour. From actual operation a directly comparable cost for fuel and lubricating oil and the removal of ashes and water in the steam engine driven ferry of the same size is $8 per hour. In many other respects the electric ferries have proved their operating superiority over the usual steam engine driven ferry. But before going into this in detail it may be well to give here a brief resume of the equipment.

Lower Operating Cost

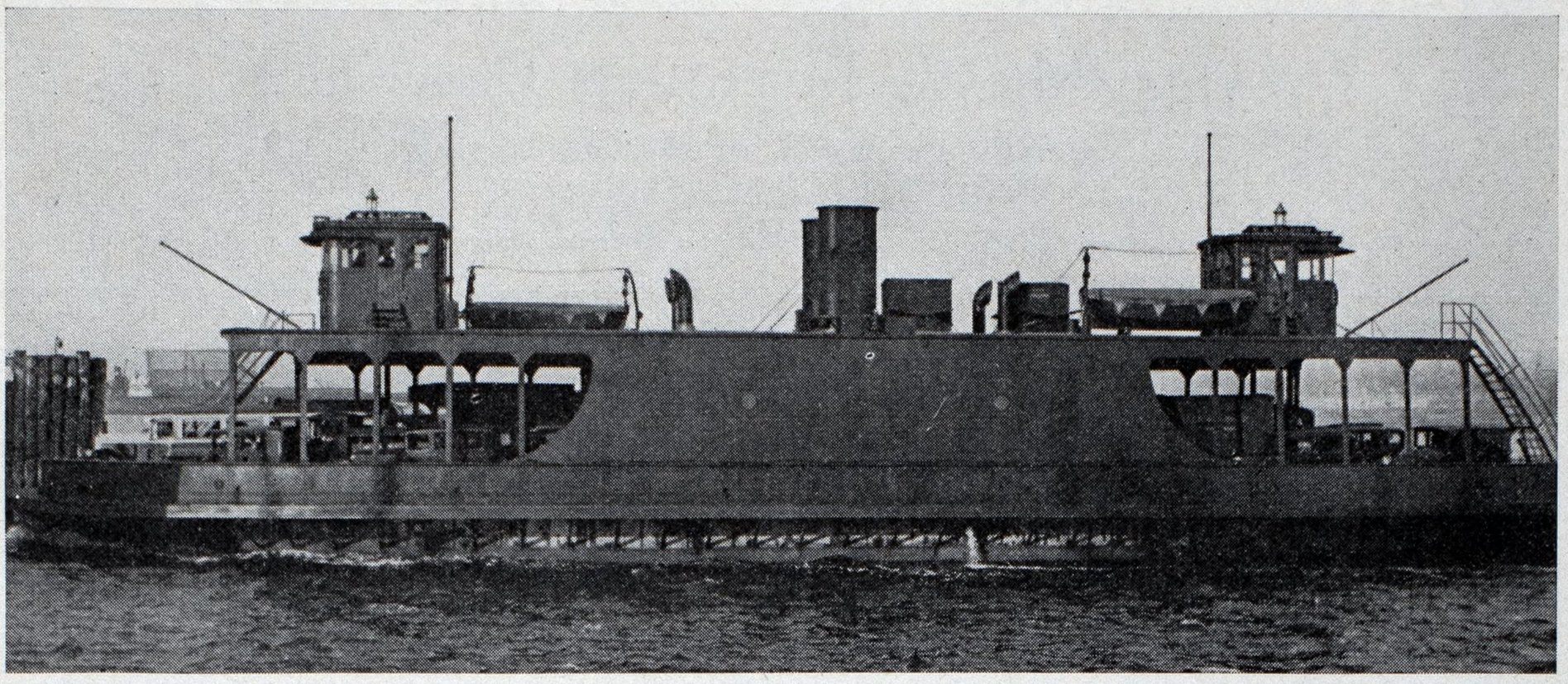
EXPERIENCE in actual service for over two years proves that the operating expenses of the diesel electric ferries in the run on the North river between New York city and Weehawken, N. J. are much less than that of comparable modern steam ferries. The difference is large. It is in the order of five to twelve. Under the circumstances in runs of this kind why build steam ferries? Perhaps there may be some good reason for doing so but considering all the factors, initial cost, upkeep and operating expense, no justification is apparent. If the operator demands definite proof of the reliability and the superior performance of the diesel electric drive it is available in the record already made by these ferries and in their daily maintenance of express train schedules.

The fleet of the Electric Ferries Inc. consists of six vessels: the GOVERNOR MOORE, CHARLES W. CULKIN, GRENVILLE KANE, W. A. BALDWIN, FREDERICK PIERCE and FRANK E. GANNETT. The first three of these ferries were delivered to the owner in November 1926, the last three in December 1926 and January and February 1927 respectively. They were designed by Eads Johnson and were built by the New York Shipbuilding Co., Camden N. J. They are built of steel throughout with the exception of wooden decks to prevent slippage. The general dimensions are: Length overall, 155 feet, length between perpendiculars, 131 feet, breadth over guards, 48 feet 6 inches, breadth molded, 37 feet, depth molded, 14 feet 3 inches, draft light 8 feet 6 inches, draft loaded, 9 feet, displacement light, about 500 tons. Each boat has a capacity of 50 automobiles or 40 mixed motor vehicles such as trucks, busses and automobiles. In one case as many as 55 automobiles were accommodated on one boat at one time. The speed is 13 miles per hour and the fuel oil capacity is about 3500 gallons.

The machinery consists of two New London Ship & Engine Co. mechanical injection, 4-cycle, single acting, 6-cylinder diesel engines developing 350 brake horsepower each at 280 revolu-



FIVE OF THE SIX DIESEL ELECTRIC FERRIES AT WEEHAWKEN, N. J.—GRENVILLE KANE, W. A. BALDWIN, CHARLES W. CULKIN, FRANK E. GANNETT AND GOVERNOR MOORE—ALL BUILT BY THE NEW YORK SHIPBUILING CO.



One of the Diesel Electric Ferries, the W. A. Baldwin, Approaching the Weehawken Side

tions per minute. Each one of these diesel engines is direct connected to an electric generator of 240 kilowatts at 250 volts. There is also on the generator shaft an exciter of 35 kilowatts. The electric current so generated drives one shunt wound eight pole direct current double armature motor of 580 horsepower at 250 volts and 180 revolutions per minute. The motor is directly connected to a continuous propeller shaft carrying a three bladed 7-foot propeller at each end. All of the electrical equipment was furnished by Electro-Dynamic Co.

Economical Space Arrangement

On account of the diesel electric drive an exceptionally economical arrangement of space for vehicles is made possible. The only obstruction is the two narrow steel trunks for access to the engine room. Five lanes of traffic are thus provided accommodating 40 automobiles and 5 large trucks or busses. Passengers and horses are not carried.

The course of the service of the Electric Ferries Inc., lies across the Hudson river from Twenty-third street, New York to Weehawken, N. J. and return. There is one slip at each terminus. Night and day these ferries keep up a continuous, quick and dependable service. Three of the boats are run at a time, being relieved at regular intervals by the other three. It is nothing unusual for one of these boats to be in service for 92 hours without stopping the engines.

One boat is called the 24-hour boat, another the 17-hour and a third the 12-hour boat. The first of these makes 120 single trips or 60 round trips in the 24 hours. The second boat makes 102 single trips or 51 round trips in 17 hours and the third boat makes 72 single trips or 36 round trips in 12 hours. The distance covered between slip and slip is about 5000 feet or just under one mile. The average run takes six minutes and this means 8 minutes against the tide and 4 minutes with the tide. A schedule regular to the minute like that for trains, is maintained with a seven-minute headway. On Sundays and non-rush hours on week days a ten minute headway is observed. Over 8600 trips per month are made. As much as 200 tons deck load is carried during rush hours in automobiles, trucks and busses. An average of 3500 vehicles are transported each day.

Yearly Maintenance Cost Low

The crew of each boat consists of a captain, engineer, wheelsman, deckhand and oiler, that is, five in all. On a similar sized steamboat the crew would consist of a captain engineer, wheelsman, two deckhands, one oiler and one or two firemen, depending on whether the fuel used is oil or coal.

From actual operating experience it has been found that the maintenance cost per year per boat averages $2500. Of this amount $1000 is for painting and drydocking; $800 is for other above deck work; and the remaining $700 is the entire repair and maintenance expense in connection with the machinery end. In the more than two years that these boats have been in operation no major replacements have been necessary to the machinery. There has been no major breakdown of any kind. Minor adjustments and cleaning of valves can be done during operation by shutting down one of the engines. Each boat is given a two-day layoff per month for a general overhaul. It must be remembered that several of these boats have been constantly in operation since November 1926, and not a single boat has yet had a shop overhauling.

Eliminate all Standby Losses

In considering the advantages of the diesel electric drive in a service such as that described here, over the steam driven ferry, many things must be taken into account. It has been found in the practical results attained that the actual cost of fuel, be it coal or oil, is much greater for the steam ferry than the cost of fuel and lubricating oil for the diesel electric ferries described here. However there are other very definite advantages from an operating point of view.

With diesel power there are no standby losses whatsoever. On practically a moment's notice the vessel is ready to give service. In the case of the steam vessel it is necessary to allow the boilers to cool off for a period of 12 hours or so. From dead it takes approximately 24 hours to again put them into service. In order to maintain service it is of course necessary to have a spare boat standing by. If it is a steam

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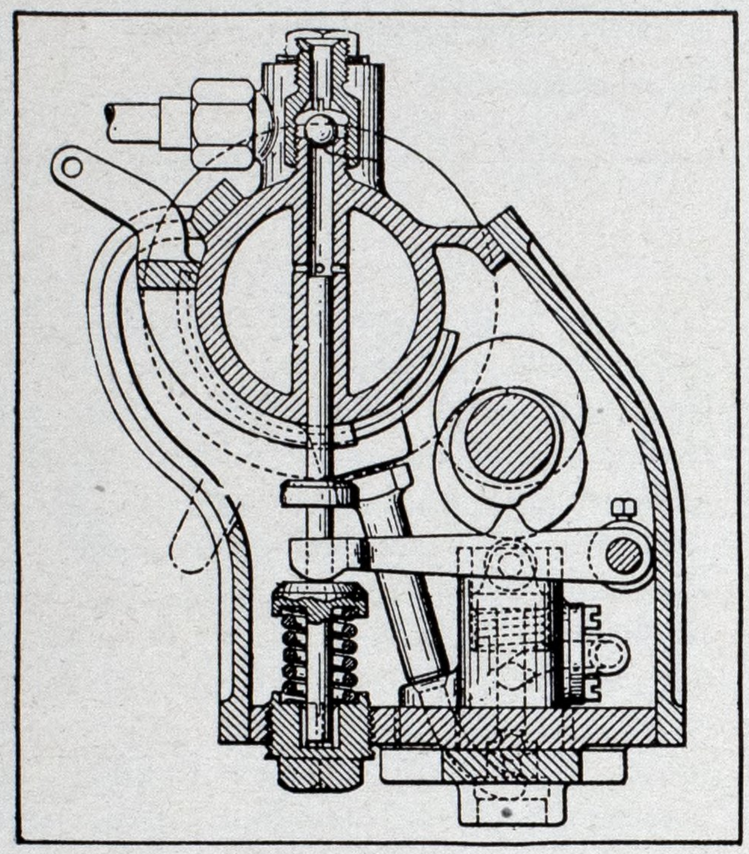
Patents Show Marine Development

Latest Marine Inventions Described

Specially Prepared for Marine Review
By Richards and Geier

Patent Attorneys, 274 Madison Avenue, New York

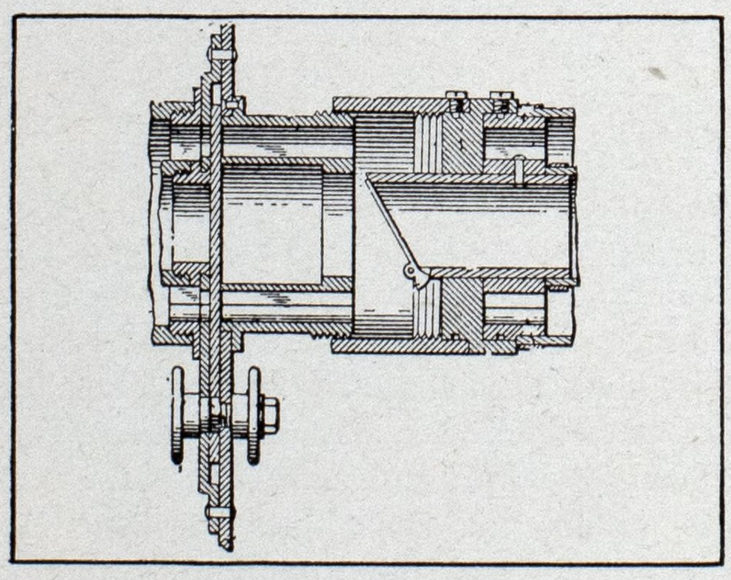
THIS invention relates to improvements in process of and apparatus for supplying fuel oil to diesel type internal combustion engines, and the object of the invention is to provide for the feeding of oil from a pressure slightly below the air pressure or slightly below the cylinder pressure if the oil is injected directly.



FUEL FEED FOR DIESEL TYPE INTERNAL-COMBUSTION ENGINES

U. S. patent No. 1,698,356. Andre C. Attendu, Montreal, Quebec, Canada. Filed Feb. 6, 1920. Serial No. 356,774.

THE main object of the present invention is to facilitate the saving of lives of those within a submarine, which, by reason of accident or other cause, is unable to rise to the surface. This is accomplished by the connection of a conduit to the submarine whereby air, water, liquid food or other fluid may be delivered to the interior of the submarine.

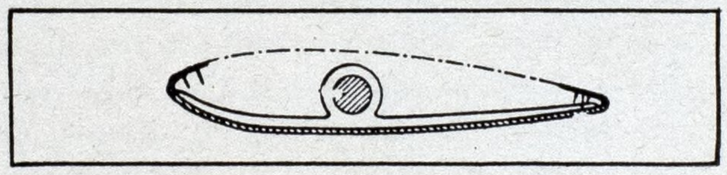


LIFE-SAVING ATTACHMENT FOR SUBMARINES.

U. S. patent No. 1,700,187. Michael Trepeta, New Rochelle, N. Y. Filed March 26, 1928. Serial No. 264,604.

WE HAVE made arrangements with the patent attorneys Richards & Geier, to publish data relating to letters patent issued in the United States covering inventions which may be of particular interest to our readers. The patents described, some of which have accompanying cuts partially illustrating the inventions, are all of recent date and we are planning, in subsequent issues, to publish similar information on patents pertaining to various phases of marine development work. Should our readers be interested in obtaining a printed copy of any of the patents appearing in this issue, or any other patent desired, such copies may be had by addressing request to the editor or directly to the contributors of this page.

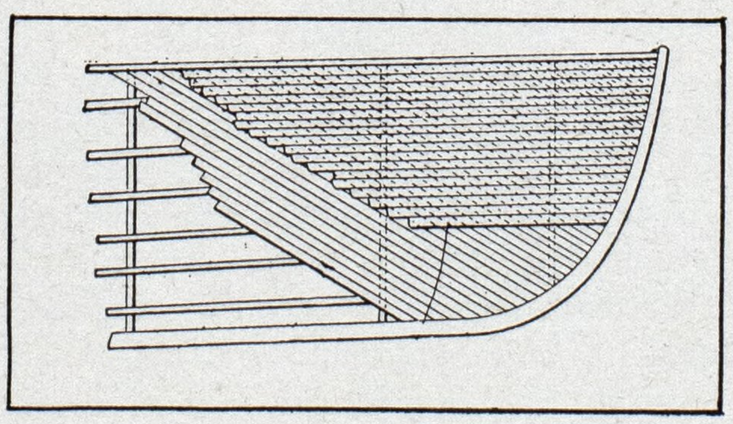
THIS invention relates to rudders of the balanced or semi-balanced type, in association with open stern frames, and the object of the invention is to effect certain improvements in such rudders.



SHIP'S RUDDER.

U. S. patent No. 1,699,931. John Tutin, Sunderland, England. Filed Sept. 20, 1927. Serial No. 220,783, and in Great Britain Sept. 25, 1926.

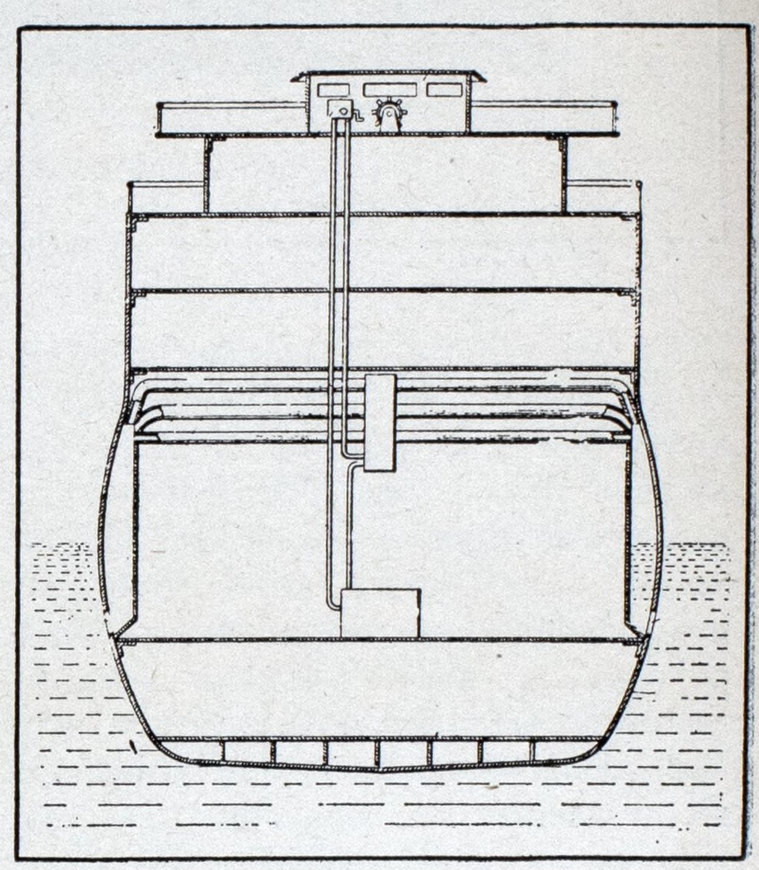
THIS invention relates to an improved boat construction; and has for its objects to provide a boat construction that is very strong and durable an yet light in weight and one that will not weave, wring or twist, but will retain its original shape even when subjected to the great strains of being driven at high speed through a heavy seaway.



BOAT

U. S. patent No. 1,698,304. L. F. Herreshoff, Marblehead, Mass., assignor to Dyer Motorcraft Corp., Providence, R. I., a corporation of Rhode Island. Filed April 11, 1928. Serial No. 269,-210.

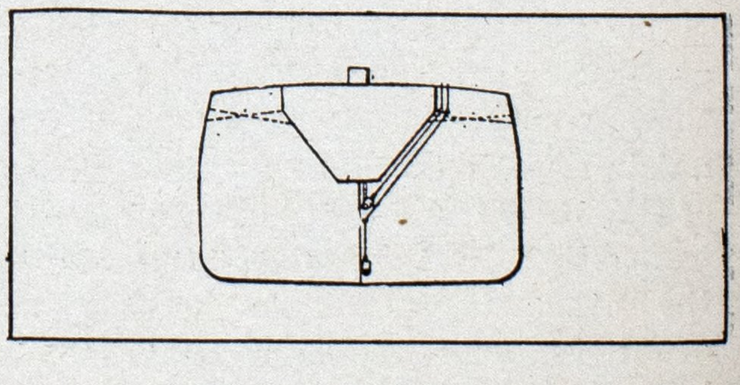
A PRINCIPAL object of the invention is to provide against undesirable oscillation of a vessel afloat in a natural medium by the utilization of quantities of the medium for opposing by their weight the natural rolling movement of the vessel. Rolling is thus checked in a seaway.



SHIP STABILIZER.

U. S. patent No. 1,700,406. John Hays Hammond Jr., Gloucester, Mass. Filed Aug. 3, 1926. Serial No. 126,762.

THIS invention relates to improvements in steel ships carrying bulk-oil and other fluid cargoes in holds and its objects are, by means of the proposed disposal of longitudinal bulkheads, to minimize the shifting of the cargo in holds which is peculiar to this class of ships, to make the construction and its oiltight work easier, to make it simpler to lay pipes for working liquid cargo, and to make more efficient and economical general functions of the ship of this class as compared with existing types of ships designed to carry oil or other fluid cargoes in bulk.



DISPOSITION OF BULKHEADS IN OIL CARRYING SHIPS

U. S. patent No. 1,699,709. Chozo Ono, Kamakura-Machi, Kamakura-Gun, Kanagawa-Ken, Japan. Filed June 5, 1928. Serial No. 283,073, and in Japan June 21, 1927.

Ship Experts Appointed for Safety Meeting

President Coolidge is to be commended for his action in naming several practical shipping men as delegates of the United States to the conference on safety of life at sea which is to convene in London. Omission of representation of the Society of Naval Architects & Marine Engineers, the American Bureau of Shipping and the American Steamship Owners' association would have greatly weakened the delegation.

The following delegates have been approved by President Coolidge: Capt. C. A. McAllister, president of the American Bureau of Shipping; H. G. Smith, vice president of the Council of American Shipbuilders; both prominent in the affairs of the Society of Naval Architects & Marine Engineers; and H. B. Walker, president of the American Steamship Owners' association. These three may be said to represent the merchant marine. Other delegates representing the government are: Representative Wallace M. White, Charles E. Barnes, Rear Admiral George M. Rock, Capt. Clarence H. Kemps, Arthur J. Tyrer, Dickerson N. Hoover, William B. Terrell, and Rear Admiral J. G. Tawresey, C. C. U. S. N. retired, representing the shipping board.

According to latest advice the convention will convene in London, April 16. Much study of existing rules and regulations having to do with the construction, operation and equipment of merchant vessels has already been carried out.

Coast Guard Cutter Bids

Bids for the construction and equipment of coast guard cutters Nos. 50 and 52 were opened at 2 p.m., Feb. 21, at Washington.

The following bids were received for each vessel: General Engineering & Dry Dock Co., $839,500; Maryland Dry Dock Co., $898,041; Bethlehem Shipbuilding Corp., $915,500, with an alternate bid of $844,000; New York Shipbuilding Co., $919,600; Pusey & Jones, $920,311; Newport News Shipbuilding & Dry Dock Co., $1,050,000; Sun Shipbuilding & Dry Dock Co., $1,100,000. At the time this was written contracts had not been awarded.

Shipping Board Acts to Sell 253 Freighters

On Feb. 12, the United States shipping board made the greatest effort it has yet made to place the American merchant marine completely under private ownership. This came in the form of a resolution of the board when it voted unanimously to advertise 253 government-owned steel cargo vessels for sale to private interests.

Announcement of this intention on the part of the board to turn the vast fleet over to private interests came a short time after the board members had returned from conferring with the commerce committee of the senate regarding the sale of the last of the government passenger lines to private interests.

The majority of the vessels concerned in this latest project of the board are tied up in the Hudson and Delaware rivers, while some are at New Orleans. There are said to be none of the laker type of which the board still holds 35. In the event that this plan is carried through, something like 100 vessels will be still held in reserve by the board.

Repair Yards Unite for Better Service

AT THE close of the business day on Thursday, Feb. 28, six of the principal ship repairing companies at the Port of New York were brought under unified management when the United Dry Docks Inc. took formal possession of their properties.

The plants involved were those of the Morse Dry Dock & Repair Co., James Shewan & Sons Inc., W. & A. Fletcher Co., New York Harbor Dry Dock Co. Inc., Staten Island Shipbuilding Co. and the Theodore Crane's Sons Co. The properties acquired have a total of 27 dry docks, located at the most accessible points around New York harbor, with an aggregate lifting capacity of 160,000 tons. Combined, these yards handle upwards of 7,000,000 tons annually.

Edward P. Morse, the veteran shipbuilder who heads the Morse Dry Dock & Repair Co., is president of the new corporation and George H. Bates, of the Staten Island Shipbuilding Co. is associated in the management. Both are men of long experience and of recognized ability in the ship repair business and will have the support of an able board of directors, consisting of Joseph W. Powell, Boston, wartime head of the Bethlehem Shipbuilding interests, former president of the Merchant Fleet Corp., and ex-naval constructor; Edward P. Farley, ex-chairman of the United States shipping board, president of Edward F. Farley & Co., chairman of the executive committee, American-Hawaiian Steamship Co.; Hubert E. Rogers, New York attorney, director, Atlantic Gulf & West Indies Steamship Co. and other corporations; J. E. Aldred, Aldred & Co.; Murray W. Dodge, Chase Securities Corp.; Richard F. Hoyt, Hayden, Stone & Co., Atlantic Gulf & West Indies Steamship Co.; and E. P. Morse, president of the corporation.

Mr. Morse, in commenting upon the new alignment, said: "Unified management for the 27 dry docks, of which United Dry Docks Inc. now takes actual possession, is undertaken primarily as a measure of improved service to ship operators and to prepare to render more efficiently the more advanced types of engineering and other services which must increasingly be in demand. In the past few years, the maritime nations of the world have engaged in a development of ship design which has not been paralleled since the change from sailing vessels. The Jones-White bill and other evidences of an awakening maritime consciousness in this country make it clear that our own development soon must take on a similar activity.

"Few people realize what vast changes in the shipping business have come about since the war, in all the great ports of the world. Prior to 1914, there were perhaps 26,000 ships in the world over 100 tons net register; of these, only about three thousand were over 2500 tons, most of such tonnage ranging from 8 to 10 knots in speed. Since 1914 has come the intensive development of liner service, an advancement for which the United States shipping board deserves a great deal of credit. The new ships are larger and faster; they represent greater investments and higher earning power and they sail on schedule. This quickening influence has affected every port everywhere but, most of all, the Port of New York, to and from which the highest class and the greatest tonnage in the world operates. Therefore, at this port, where liner service has become so dominant a factor, with its definite sailing dates, it becomes increasingly important that ships in need of repairs encounter no delays but have the promptest service.

"The companies participating in this enterprise have brought their properties to a high state of development, under the impetus of a vigorous competition. It now will be possible to meet, and to anticipate, many of the more urgent needs of the shipping trades, through a wholesome policy of co-operative efforts.

"It must be apparent," Mr. Morse continued, "that for the individual companies each to maintain a constant state of preparedness for heavy peak loads has entailed a needless and wasteful financial burden which the new alignment now can turn to more productive and serviceable uses. The company has many plans in mind for reducing the cost of work, which will directly benefit the customer. To mention only a few of the more obvious means of improvement, the company now can make available to customers the combined talents of the ablest engineering minds, both within and without the organization. Always subject to the customer's desires, it now will be possible to send a ship to the yard best adapted for the work to be done and where the quickest service may be rendered. This tendency to level out the peaks and valleys of the work will result in a continuity of employment for yard forces which will be of greatest importance in raising the grade of workmen employed, thus reacting to the benefit of all concerned.

"It is difficult to imagine a project of such magnitude in which everyone at interest seems more certain to benefit," Mr. Morse declared. "The management of the individual yards will remain in the hands of the able men who always have operated them; each of the former owners has a vital financial interest in the new enterprise; the new form of operation will provide each yard with more and better service facilities than any one alone could have afforded to maintain; they will be able to effect ship repairs with a speed and at a cost which cannot be rivaled by any port in the country.

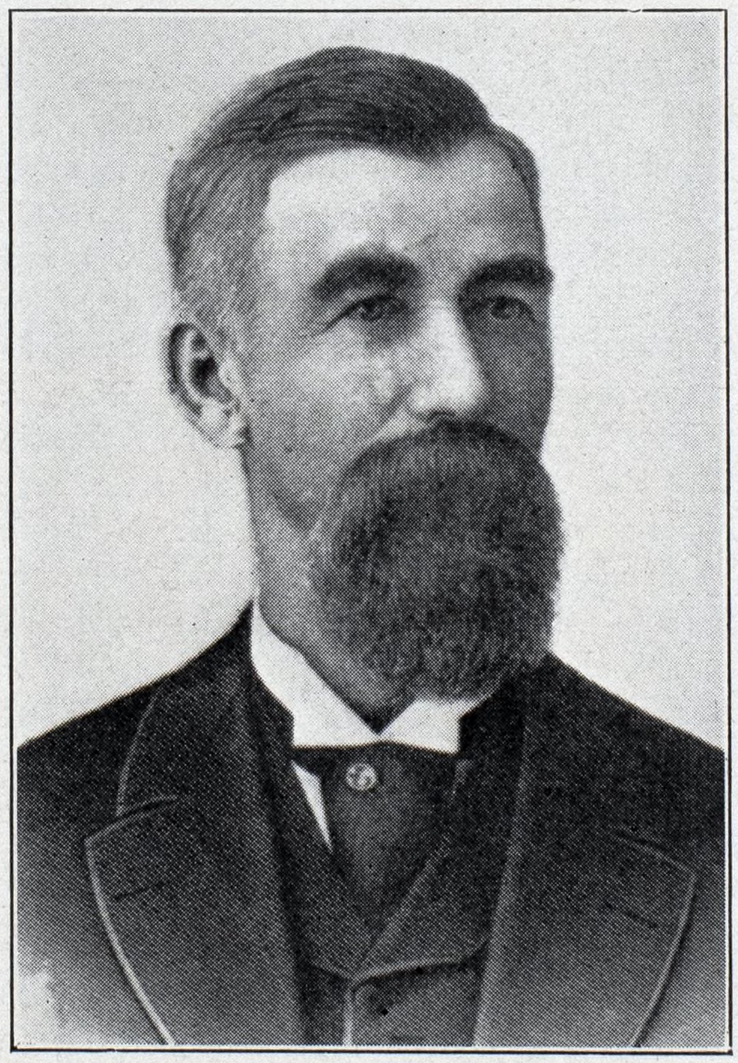
"In the full realization that idle time is the costliest of all elements in the repair of ships, we pledge our best efforts to make the service of United Dry Docks Inc. a standard for which other ports will strive in vain, and we bespeak the co-operation of shipping interests throughout the world."

Captain James Davidson 1841-1929

CAPT. JAMES E. DAVIDSON, probably the best-known and certainly the most successful among the pioneer shipbuilders and shipping men of the Great Lakes, died at his home at Bay City, Mich., Feb. 5, at the advanced age of over 87 years. He was of that sturdy Scotch stock that contributed much to building up the country.

He was born in Buffalo, Aug. 12, 1841, and had reached the age of 11 when his parents died, making it necessary for him to earn his own way. With a natural bent for the sea, he sailed in various capacities on ships of the Great Lakes. In winter, he found employment in Bidwell and Banta's Buffalo shipyard during the day, and his evenings were spent in studying in the city schools. Leaving the lakes in the winter of 1860-61, he shipped as a sailor on deep sea voyages of the famous Black Ball line and served on a number of clipper ships and schooners. Returning to the lakes, he enlisted in the government service, and was made a first lieutenant on the United States schooner WATCHFUL, operating in the lighthouse service.

Following the close of the war, he was employed by Captain Bradley of Buffalo as first mate on the schooner SEAGULL, eventually acquiring a half interest in the vessel. After two years, the boat was sold at a profit and the schooner PHILENA MILLS was purchased for $4500. This vessel also proved profitable and after several years' service, he was successful in selling her for $6500. His next purchase was the schooner LOUIS WELLS, which he bought the following winter and operated for four years, working at the Banta and Bidwell shipyard during the winter months.



At the end of the fourth year of operation of the LOUIS WELLS, the vessel was sold and Captain Davidson determined to build ships on his own account. In 1870, at Saginaw, Mich., his career in shipbuilding began with the construction of the KATE WINSLOW, at that time said to be the largest schooner on the lakes. The present shipyard at Bay City, Mich., was established in 1872. During 1873 and 1874 the JAMES DAVIDSON, then the largest steamer on the Great Lakes, was built. At this time the sawmill, in which the oak timbers were cut, was burned and this, added to the panic during the years 1875, 1876 and 1877, caused a temporary abandonment of shipbuilding work. Construction activity was resumed in 1880, and continued until the timber supply was exhausted.

In 1887, Captain Davidson and his family moved from Buffalo to Bay City, where the family residence has since been. Always greatly interested in machinery to improve ship operation, he was the first to introduce the triple expansion engine on the Great Lakes. This engine was installed in the ROUMANIA. He was also responsible for introducing the steam steerer, steam windlass, steam towing machine and later the Howden system of forced draft. Altogether, 108 wooden ships were built at the Davidson shipyard at Bay City. Following the discontinuance of the yard as a shipbuilding plant, it was used for drydocking and repairing. It is interesting to note that several of the largest and most successful steel ships on the lakes were constructed from models prepared by Captain Davidson. During 65 years' service on the lakes as one of the largest operators, only five total losses were experienced

(*Continued on Page* 54)

New Passenger Manager for French Line

Felix Lachesnez-Heude for the past several years associate passenger traffic manager of the French line, has been promoted to succeed A. T. Henderson, retired passenger traffic manager, with the title of general passenger manager.

His rise to this important position has been rapid. Coming to America



Felix Lachesnez-Heude
General Passenger Manager French Line

for the French line after the close of the war, through which he served as a lieutenant of field artillery, Lachesnez' intention was to become a purser aboard one of the company's ships, and it was to perfect his English and familiarize himself with the land side of the passenger business that he was sent to the New York office. In the first few months he spent in the third class and immigration departments of that office, his aptitude for passenger department work, and his quick grasp of the intricate and many-sided details of it, showed itself, and he soon found himself Henderson's assistant, with all thoughts of going to sea in a purser's cabin abandoned.

It was not long before he was named associate passenger traffic manager, thus becoming, in the absence of his colleague, the actual passenger traffic manager. With the latter's retirement, Lachesnez succeeds to the post, with the new title of general passenger manager.

Lachesnez was born in Marseilles, in 1890, attended the grade schools, and then the Lycee de Marseilles, from which he graduated. In 1911 he was called to the colors to do his military service, which he did in Morocco.

For his war services he was awarded the medaille militaire, the croix de guerre, the Moroccan and Colonial medals and an Italian decoration. About a year ago, the Bey of Tunis awarded him the order of Nichaniftikar, in recognition of his work in developing American tourist traffic in French North Africa.

Elected President of Sperry Gyroscope Co.

Thomas A. Morgan was unanimously elected president of the Sperry Gyroscope Co. Inc., at a stockholders meeting of North American Aviation, Inc., which recently purchased the Sperry company. At the same meeting held Monday afternoon, Feb. 18, R. E. Gillmor was elected vice president and sales manager, Captain Thomas B. Doe, vice president of North American Aviation was elected vice president and treasurer; H. H. Thompson, secretary and O. H. Rughaase, assistant treasurer.

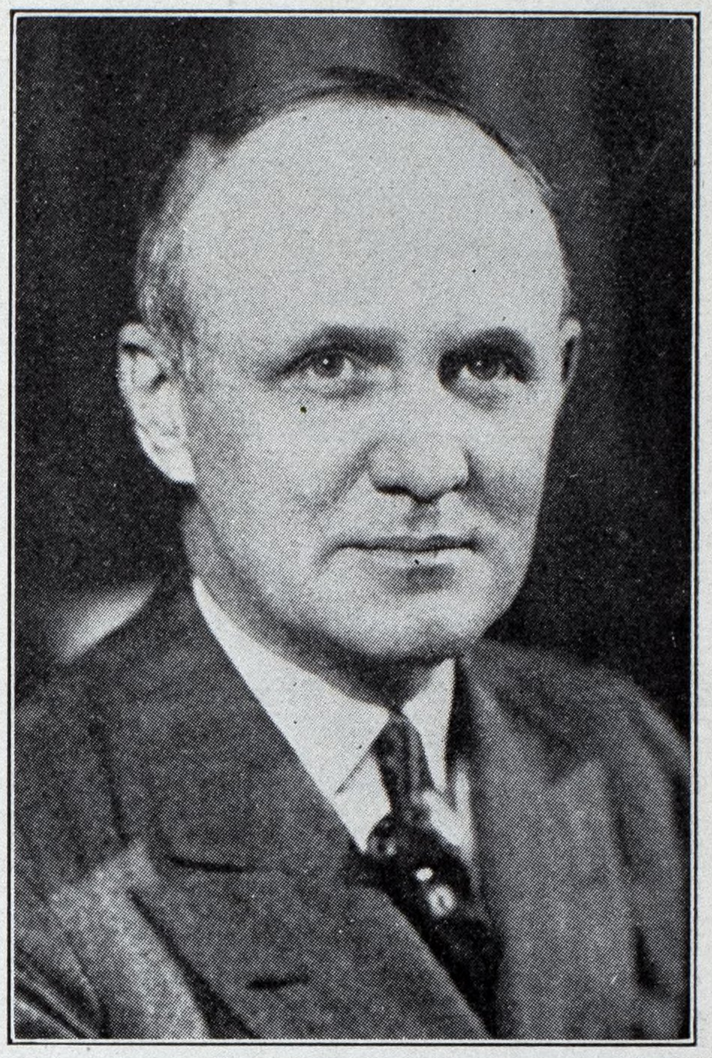
Mr. Morgan who is also vice president of the Curtiss Aeroplane Export Corp., a major in the United States army reserve corps, ordnance division, and well known in naval, military, aviation and shipping circles became associated with the Sperry Gyroscope Co. upon his leaving the naval service in 1912 after having been in charge of the Sperry experimental gyrocompass installed for tests on the U. S. S. DELAWARE.



Thomas A. Morgan
President, Sperry Gyroscope Co., Inc.

New Owner of U. S. Lines Trained in Finance

Paul W. Chapman of P. W. Chapman & Co., successful bidder for the United States lines is experienced particularly along financial lines. The company which he controls was organized in 1912 to deal in securities. Since the war his company has been especially interested in public utilities. Through organizing and con-



Paul W. Chapman
Successful Bidder for U. S. Lines

trolling the Hoboken Shore railroad which owns and operates railroad freight and terminal properties in Hoboken on the Hudson river, Mr. Chapman first made direct contact with tidewater. He is also interested in aeronautics and in combining air and water travel if it can be done.

He has been identified with Chicago banking and finance, beginning with what is now the Harris Trust and Savings Bank as an office boy after graduation from high school in 1899. He was born in Jersey county, Ill. and traces his ancestry on the paternal side from a New England family, the men of which followed the sea. He was married in 1912 to Joanna Highley of Hyde Park, Ill. There are five sons and the family lives at Highland Park, Ill.

The shipping board thoroughly investigated the financial strength and connections of Mr. Chapman and found them sound and in every way acceptable. A statement issued by the board said in part: "Mr. Chapman is financially responsible and able to proceed in accordance with the provisions of his bid."

Many Shipwrecks Mark Spot Known as Graveyard of Lake Erie

By W. A. Gordon

BEGINNING near the village of Port Rowan, Ont., and running easterly into Lake Erie for a distance of 25 miles, lies the long finger of Long Point island, entirely composed of blow sand deposited by years of wind and wave, and on account of the numerous wrecks that have happened here it is well named the graveyard of Lake Erie. The higher parts of the island are a succession of ridges or great waves of sand, running from northeast to southwest, while the west end is immense stretches of marshes.

Have Safeguards to Navigation

To protect the lives of mariners from the dangers of this place, the Canadian government erected a lighthouse in 1833, the foundation of which is still visible. The next light was erected in 1834, about a mile farther east, which was 75 feet in height to the lamp. This old light is now used as a lookout by the life saving crew. The present light was built in 1915, about another half-mile east, on land which was deep water when the former one was built. Nothing could show in so striking a manner how the island is growing eastward. This lighthouse is 102 feet high from base to vane on lantern tower and is of 100,000 candlepower, the lens costing $5000. The light gives a white flash every eight seconds and is visible for 15 miles from all points of approach.

Nearby are the fog station, keepers' residence and life saving station, whose crew patrol the beach nine months in the year, giving aid when necessary in safeguarding ships.

One of the earliest wrecks on record here is that of the schooner CONDUCTOR, when Abigail Becker, "the heroine of Long Point," rescued the crew of eight men, on the night of Nov. 22, 1854, by wading out into the surf and catching them as they jumped from the rigging into the freezing water and dragged them ashore. For this act of heroism she received a gold medal from the New York Life Saving association.

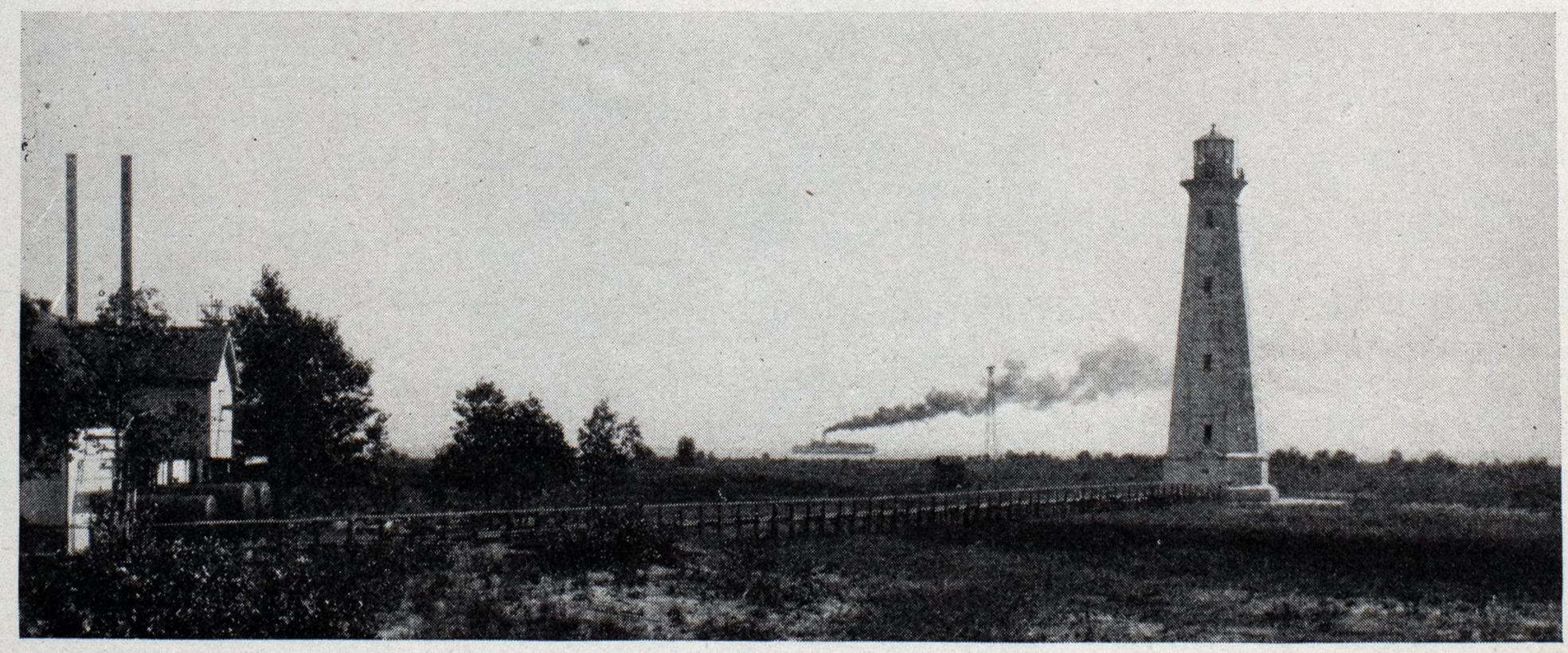
Several of the old wrecks are still visible, among them the barge BELLE CASH, wrecked in 1877, the schooner LEADVILLE and the schooner ALZORA, all of which lie near the old lighthouse on the south beach. Among the worst wrecks was the steamer IDAHO, which occurred on Nov. 6, 1897, in which 20 persons lost their lives. The steamer MARIPOSA, Capt. Frank Root, rescued two of the crew from the rigging after making several daring attempts.

The steamer ATLANTIC was sunk in collision off the island in 1853, a short distance south of the lighthouse, with $26,000 in gold aboard. The wreck was located by Capt. McGroeder with the steamer DOUGLASS in 1872-3 and later in July, 1910, but whether the gold was recovered only the treasure hunters know.

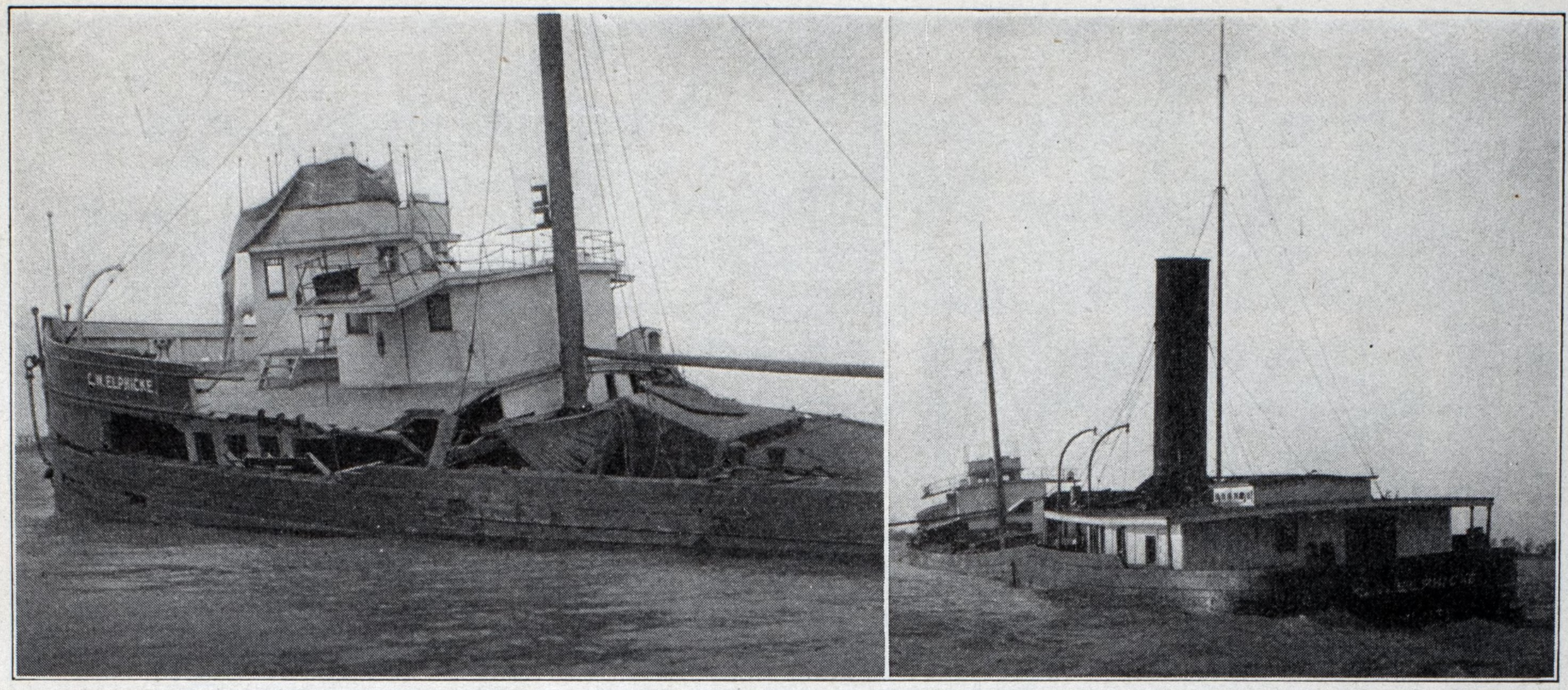
The steamer JERSEY CITY was wrecked here in the early sixties and later her valuable copper tubed boiler was recovered. This boiler was later installed in an American gunboat which served throughout the Civil war.

Loss of Carferry Bessemer

Among the more recent disasters at the island was that of the steamer SIBERIA, laden with barley, in 1904. She became waterlogged and sank off Bluff bar, inside the point, but the crew all escaped. On Nov. 19, 1908, at almost the same spot, the steamer PASCAL P. PRATT, loaded with coal, was beached and burned to the water's edge, fire having started between the engine room and bulkheads, driving the crew from the pumps. In a heavy sea, the crew escaped in their lifeboats and were taken care of by the lightkeeper, Mr. Cook.



Long Point Light and Fog Station at Left—Canadian Shore, Lake Erie



STEAMER C. W. ELPHICKE LOADED WITH WHEAT WRECKED OFF LONG POINT ISLAND, ONT., OCT 21, 1913

On the night of Oct. 21, 1913, the old wooden steamer C. W. ELPHICKE, downbound from Port Arthur to Buffalo, loaded with 106,000 bushels of wheat, encountered heavy weather, sprang a leak and commenced to sink. The captain endeavored to round the island and beach her in smooth water, but it was too late and he put her ashore near the lighthouse. The life saving crew reached the wreck after a hard struggle and rescued all of the personnel. The steamer broke up in a few days, before the wrecking crew could recover the cargo, which all washed up on the beach, soon attracting thousands of wild ducks.

One of the worst tragedies of Lake Erie happened a few years later, when the carferry BESSEMER, bound from Ashtabula to Port Stanley, was lost with all hands. She is supposed to have foundered off Long Point, as two bodies came ashore there, one a sailor, J. W. Wilson, and the first mate, named McLeod, while the body of the captain, his brother, was found in the Niagara river the following spring.

On the same night, during the terrible hurricane which swept the lake, the freighter CLARION was lost with the whole crew of 28 men in about the same place. A few days later, the Pennsylvania State fish hatchery tug COMMODORE PERRY, of Erie, Pa., in a search for survivors, picked up a CLARION lifeboat, containing nine frozen men sheeted with ice, and towed it into Erie harbor.

Liquor Laden Steamer Wrecked

The last wreck at the island occurred on Nov. 23, 1922, when the steamer CITY OF DRESDEN, laden with hundreds of cases of the choicest Canadian liquors in transit from Belleville, Ont., to Port Huron, Mich. (and presumably from there to Mexico), off the west end of island sprang a leak and had to be beached. One man lost his life, but the rest of the crew got ashore after some assistance from the people on shore. Bottles of liquor floated ashore into prohibition Ontario and were eagerly picked up by the natives, which led to many police court cases, but nothing was ever proved against anyone.

Of late years, the island has become a favorite stopping point of the rum runners who ply their trade between Port Dover and points on the American shore. Its numerous bays and inlets give them safe shelter while waiting to dodge the American coast patrol.

Huge Liners Soon Ready

On July 16, the EUROPA of the North German Lloyd line will start on her maiden voyage from Bremen for New York via Southampton and Cherbourg. The EUROPA is expected to excel all previous records in the crossing by maintaining a six-day schedule between her home port and New York. The new liner BREMEN of 46,500 tons, sister ship of the EUROPA, is to sail on her maiden voyage to New York about Aug. 27.

Work on the vessels which were scheduled to arrive in New York some time in April, was interrupted by strikes in the shipyards where they are building. It is hoped by the owners that these two new liners will recover some of the prestige of the North German Lloyd.

According to representative of the North German Lloyd, a new classification has been found necessary for the new vessels. Listed now as class "A" liners, creation of the new classification is held as a concession of increased speed. The former highest classification was for the LEVIATHAN, MAJESTIC, MAURETANIA, BERENGARIA, ILE DE FRANCE, and other express liners graded under class I.

Isherwood Construction

There is an ever increasing total of ships constructed under the well known Isherwood longitudinal system and the bracketless system, an improvement upon the former for oil tank ships. The same company has also developed a combination system which is a variation in design of longitudinal construction adapted for cargo ships, passenger and other types of vessels. At the end of the year 1928, 1653 ships of a total deadweight carrying capacity of 13,752,920 tons had been constructed on the Isherwood systems.

Among the vessels delivered during 1928 were sixteen large size tankers, six important and unusually designed shallow draft tankers and two cargo vessels. The largest of the tankers was the C. O. STILLMAN of 21,250 tons deadweight. Five other tankers were each over 15,000 tons deadweight.

In the total referred to above ending the year 1928, there are 822 tankers aggregating 7,728,430 tons deadweight carrying capacity and 831 vessels comprising passenger liners, cargo vessels, colliers, or oil carriers, Great Lakes freighters, passenger and freight ferry vessels, barges, dredges etc. aggregating a total of 6,024,470 tons deadweight carrying capacity all of Isherwood construction.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

RECITAL of bill of lading for goods in cases, "apparent good order and condition," applies only to the exterior condition of the cases and not to their contents.—Bronstein Bros. & Co. Inc., v. Societa Anonima Co-operative Fra Lavoratori Del Mare, etc., 25 F. (2d) 122.

* * *

UNDER the admiralty law as administered in American courts, there is a lien on the cargo for demurrage.—Solberg v. Cargo of Steel Rails, 25 F. (2d) 125.

* * *

IT WAS the duty of the master of a tug, fastening barges to a pier, to see that the boats were properly moored, not only to meet conditions which actually existed, but those which might reasonably be anticipated. It was his duty, too, to inspect the lines of the inner boats, to ascertain whether they were sufficiently strong to stand the added boats moored by him, but he was not required to examine the cleats and their fastenings on the inner boats or the mooring posts.—Cleary Bros. Inc., v. Port Reading Railroad Co., 85 F. (2d) 170.

* * *

WHEN logs were brought to a ship's side pursuant to the master's expressed request, and were receipted for by the master without any question being raised as to the time, speed, or manner of the delivery and without any suggestion that the delivery of any of the logs be delayed, the accepted delivery of the logs had the effect of putting them at the ship's risk.—OLGA S., 25 F. (2d) 229.

* * *

PROPER measure of damages for delay in carriage of goods is the difference in the market value of the goods when they should have been delivered with reasonable dispatch and when in fact they were.—Transmarine Corp. v. Charles H. Levitt & Co., 25 F. (2d) 275.

* * *

A RULE or regulation of state harbor commissioners, providing that vessels must not run within 500 feet from and parallel to the pierhead line, was promulgated in the interest of public safety, and public policy demands that it be strictly enforced, and applies to vessels running only short distances from one pier to another.—Leslie-California Salt Co. v. Larkin, 25 F. (2d) 299.

* * *

A PILOT'S association, owning pilot boats, managing collections through a secretary, and making rules for the handling of business for the protection of all, was not liable for damage to a ship by collision due to fault of a pilot, who was a public officer, appointed individually, responsible individually.—GRIFFDU, 25 F. (2d) 312.

* * *

SEAMAN injured in service is entitled to cure and to maintenance during the period of his disability after his discharge.—EASTERN DAWN, 25 F. (2d) 322.

* * *

WHERE a seaman suffered a severe bruise to his heel when he fell out of a berth, the master, in tendering him a marine hospital certificate which would have secured him the best of care and medical attention, when he left the ship, complied with any obligation the vessel had as to cure.—June v. Pan-American Petroleum & Transport Co., 25 F. (2d) 457.

* * *

IN ORDER to sustain a claim to a maritime lien for supplies furnished for a crew of a vessel while she was laid up for repairs in her home port, it must be shown affirmatively that the crew were on the boat engaged in work upon the boat, or that it was necessary for the protection of the boat that the crew should be still retained, or that it was necessary for the crew to be retained, because it would have been impossible to have obtained another crew for a prospective voyage of the ship.—KOCHALINE, 25 F. (2d) 503.

* * *

IN THE case of the No. 34, 25 F. (2d) 602, it was held that it is the duty of the owner of a vessel, who has engaged a stevedore to load her, to furnish the men with a safe place to work and a safe passage thereto; that where a ship, as in the instant case, was to discharge into a lighter, the shipowner, in the absence of some special contract to the contrary, would fulfill his ordinary duty when he put the goods over the rail of the ship in such a position that the consignee could take delivery of them; that a ship discharging her cargo into a lighter was under no duty to install a ladder to afford access to the lighter, on which stevedores were to receive and stow the cargo for the owner of the lighter.

* * *

THE master of a vessel is bound to know the character of his vessel and how she would turn in ordinary conditions of wind and tide.—EL VALLE, 25 F. (2d) 619.

* * *

IN the case of Swanson v. Torry, 25 F. (2d) 835, it appeared that a master of a vessel purchased certain articles of clothing for seamen on their signing, carried them on board and delivered to each man the clothing purchased for him, as each was in urgent need. The goods were paid for by the owners of the vessel and charged on the ship's logs to the several men as advances out of the "slop chest." The court held that this did not constitute "advances," within the meaning of the law, and that the sums expended were properly deducted from the earned wages due the seamen.

* * *

WHERE a vessel was unseaworthy in respect to the chain locker construction, the carrier cannot set up perils of the sea or mismanagement as defenses to a libel for damage to a shipment, unless it can be shown that the damage would have occurred despite the existence of the factor of unseaworthiness.—Rosenberg Bros. & Co. v. Atlantic Transport Co., 25 F. (2d) 739.

* * *

THE law imposes upon owners of ships the duty of using due care to ascertain and consider the nature and characteristics of goods offered for shipment, and to exercise due care in their handling, including such methods as their nature requires.—Bank line, Ltd., v. Porter, 25 F. (2d) 843.

* * *

WHERE owners knew, in addition to the two months occupied by the voyage, of long and unexpected delay in the sailing of their vessel after the loading was completed, and knew of other delays aggregating nearly two months, and knew also that the cargo included jute, and the hot climate in which the vessel had been all this time, some steps should have been taken to prevent the breaking out of fires by spontaneous combustion, said the court in the case of Bank line v. Porter, 25 F. (2d) 843, and this neglect is directly chargeable to the owners, as knowledge of facts that may be reasonably expected to lead to certain results imposes a direct liability for those results. Proper precaution on the part of the owners, such as the unloading or ventilating of the cargo, would unquestionably have avoided the fire.

* * *

SEAWORTHINESS, within the rule that the obligation rests upon the owner to see that the vessel is in all respects seaworthy, means efficiency of the vessel in materials, construction, equipment, officers, men, and outfit for the trade in which it is employed. —LLEWELLYN J. MORSE, 25 F. (2d) 973.

* * *

AFTER a vessel has been arrested, unless the arrest is colorable, no maritime lien can arise against her, it was said in the case of Feldman v. American Palestine line, 25 F. (2d) 1002.

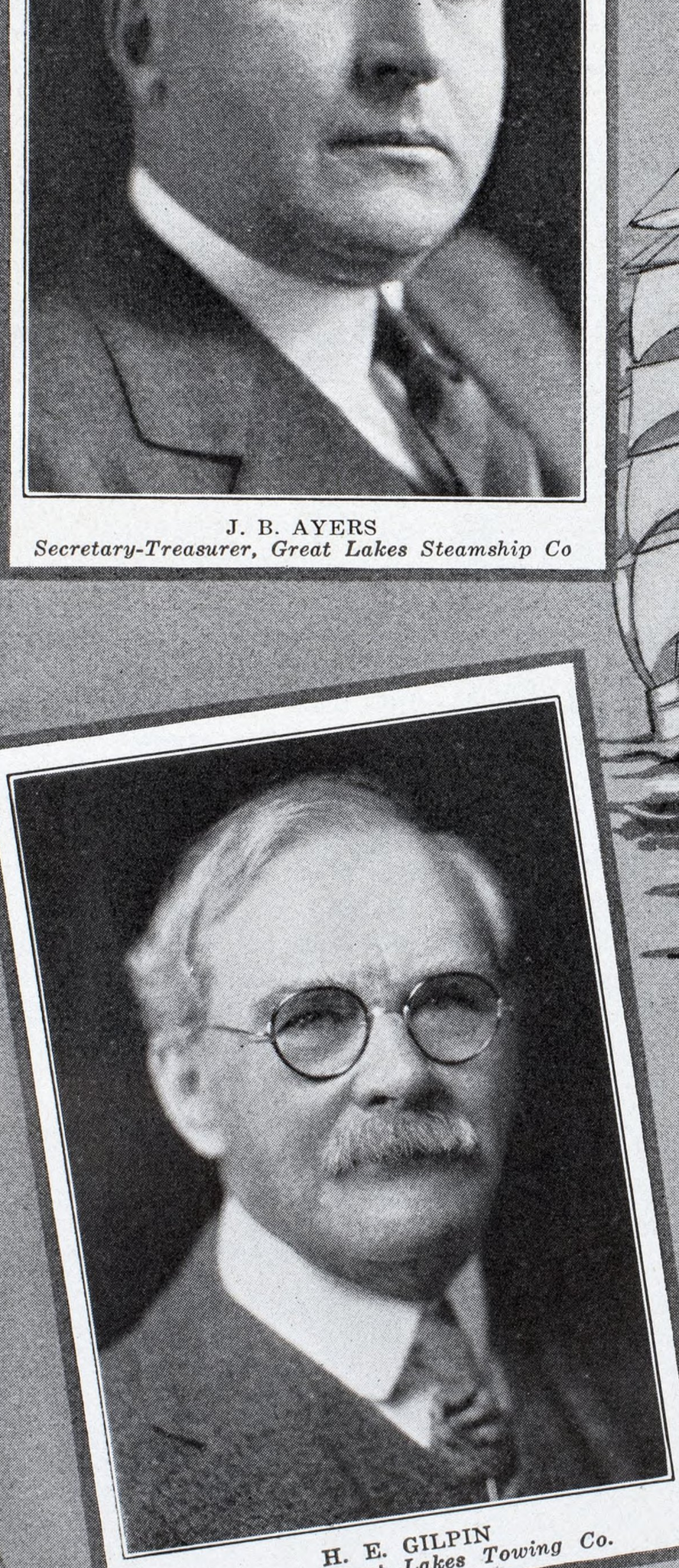
MEN of MARINE AFFAIRS



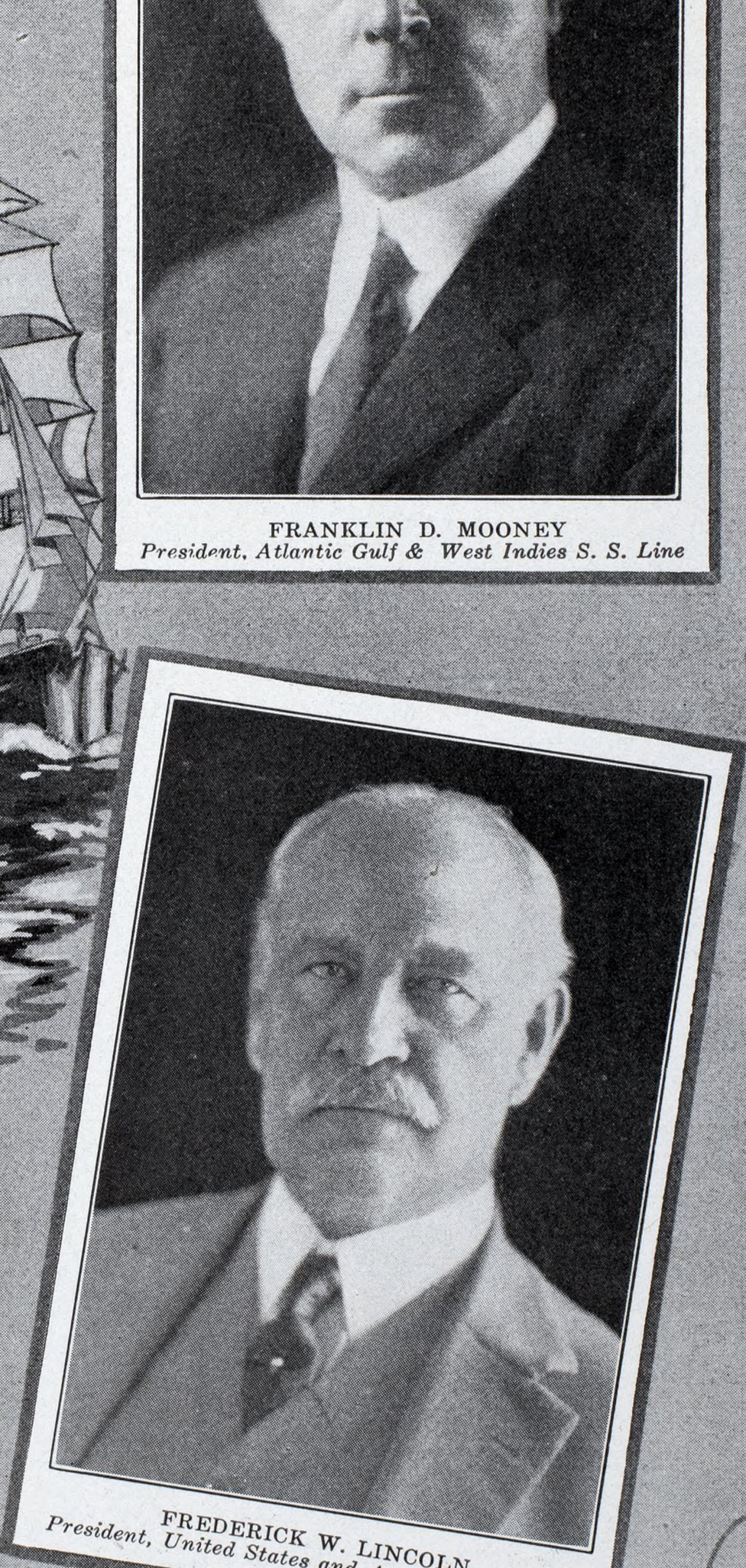
J. B. AYERS
Secretary-Treasurer, Great Lakes Steamship Co



FRANKLIN D. MOONEY
President, Atlantic Gulf & West Indies S. S. Line



H. E. GILPIN
President, Great Lakes Towing Co.



FREDERICK W. LINCOLN
President, United States and Australasia S. S. Co.

Photos by Blank-Stoller, Inc.



Modern Stevedoring and Dock Management

Practical Ways to Cut Costs in Cargo Handling

How to Improve Service to Ships

Conducted by H.E.Stocker

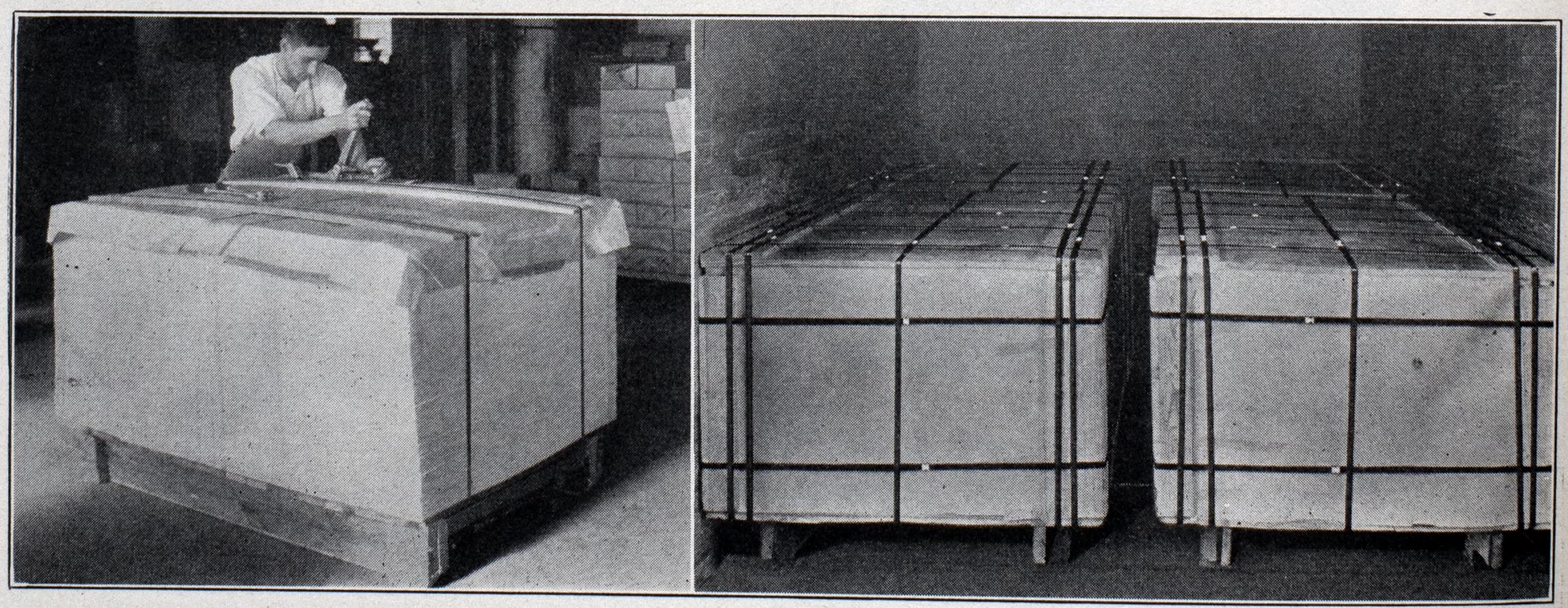


Skids Used for Through Shipments Reduce Cargo Handling Costs

HANDLING costs have been reduced from 25 per cent to over 90 per cent by the use of skids and lift trucks in manufacturing plants and on railroad lines. Nine million skids and 110,000 lift trucks are now in use. Although skids and lift trucks are not used extensively as yet in the shipping industry they have effected reductions in cargo handling costs of over 40 per cent.

The Eastern Steamship Co. has brought about important economies through the use of this method. This company handles printing paper on skids from Portland, Me., and from Boston to New York city. Movements in larger units, less handling in unloading cars, and in loading and unloading motor trucks, have resulted in reducing stevedoring costs more than 40 per cent. When the floor of the dock is put in good condition a tractor will haul two skids, and the saving will be not less than 75 per cent. Both of these figures include the capital charges and the repairs on the tractor and the trucks. The capital charges and the repairs on a hand lift truck amount to approximately 30 cents a day.

The skids used for shipments of paper are usually built at the paper mill from scrap lumber and are one time, or nonreturnable skids. The shipments of paper on skids are handled by hand lift trucks at the paper mill into a car. This is unloaded at the Eastern Steamship Co.'s terminal at Portland, Me., and taken through the side port with a hand lift truck. On arrival at New York, the skids are taken from the ship by a hand lift truck and hauled by an electric or a gasoline tractor to the bulkhead at the head of the dock to facilitate loading into motor trucks. The bulkhead is not on a level with the truck so it is used in conjunction with a portable ramp and a hand winch on the dock to load the skids on the motor truck. The tractor was bought to haul trailers and it is used for that purpose if not hauling lift trucks.



LEFT—PAPER BEING STRAPPED ON A NONRETURNABLE SKID. RIGHT—PAPER ON SKIDS STOWED IN A BOX CAR

At Boston the skids are transferred from the railroad car to the steamship terminal by motor truck. In addition to paper on skids the Eastern Steamship Co.'s Boston, New York line handles skids loaded with unbound books. Light packages are stowed on top of the skids when stowage or space requirements make this necessary.

Skids Reduce Handling Costs

Besides reducing stevedoring costs, the use of skids has made checking and sorting easier and has reduced claims. In addition, acceptance of paper on skids has brought the line business which would otherwise have moved all rail.

The lift trucks used by this company have a capacity of 5000 pounds and a lift of three inches. Standard lift trucks vary in capacity from 500 to 20,000 pounds and vary in lifting height from three quarters of an inch to three inches. The truck lifts the skid clear of the floor by one to eight up and down movements of the handle, according to its capacity. When the load is to be lowered a release pedal is pressed with the foot. The load is dropped without a jar by the operation of a hydraulic checking cylinder filled with oil. In one make of truck this cylinder is in a vertical position back of the handle, while in others it is placed in the center of the truck in a horizontal position. These cylinders are clearly shown in the two illustrations.

Handles of the trucks used by the Eastern Steamship Co., Blackstone Valley line and others, will elevate or lower the load from any point in an arc of 180 degrees, a valuable quality when working in restricted spaces on ship and shore. Roller or ball bearings, and wheels as large as the underneath clearance of the skid will permit, are provided to reduce the effort needed to move the truck and load.

Hauling Skids by Tractor

The Hudson River Night line carries shipments of printing paper on skids from Albany to New York. These skids are shipped to Albany in railroad cars. At that point the cars are unloaded and the skids are taken into the ship with a hand lift truck. At the New York pier, the skids are unloaded with a hand lift truck hauled by an electric tractor. Plans are being considered to haul two skids with a tractor which will make the total saving over 70 per cent as compared with handling shipments in cases. These figures take capital charges and repairs into consideration.

Shipments of paper on skids also originate at Saugerties and other Hudson river ports, and move to New York by the Saugerties Steamboat line and by the Catskill Evening line. The first line, lacking a bulkhead at the New York pier, loads the skids on motor trucks by means of a portable ramp and the truck's winch.

The Catskill Evening line handles a ton of cardboard on skids without packing or strapping. These skids are carried by motor truck from the mill to the up-river terminal and from there are moved to the New York dock where delivery is made to the consignee. Bundles of paper are also handled in this manner. Permanent skids are used, half of which are owned by the shipper and half by the steamship company.

The Detroit & Cleveland Navigation Co. carries storage batteries from Cleveland to Detroit on three tier racks mounted on skids. The batteries are placed on the rack at the Cleveland dock and are not removed until they reach the consignee's factory. Occasionally shipments of other commodities move on skids from shipper to consignee. The skids are handled on the docks of the Detroit and Cleveland line by hand and electric lift truck.

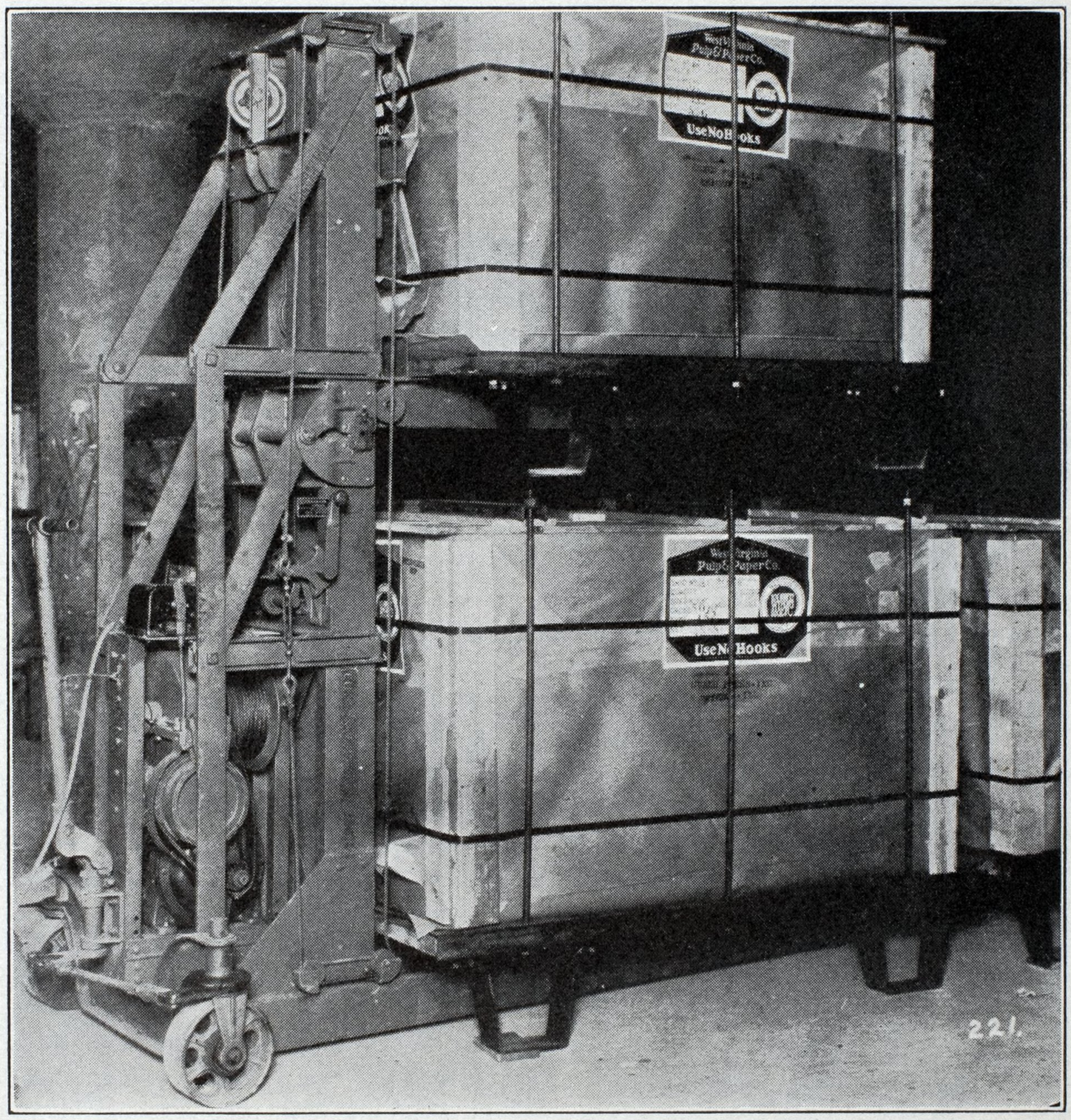
The Lee & Simmons Lighterage Co. handles sugar in sacks on skids from the sugar refinery at Edgewater to the cars of the New York Central railroad at its Weehawken pier.

The Ocean Steamship Co. handles paper on skids from Boston to South Atlantic ports.

Less Handling of Shipment

One shipping company, operating ships with overall hatches, is experimenting with shipments on skids moving from factory to consignee's warehouse. In one instance a plan is being worked on to combine a carload of 2850 cases into twelve skid loads. At present each case is handled twelve times from factory to consignee's warehouse, making a total of 34,200 handlings. This shipment can be combined into twelve skid loads thereby reducing handlings to 144, a decrease of 99.6 per cent. The consequent economy will pay for the skids and lift trucks within a few months.

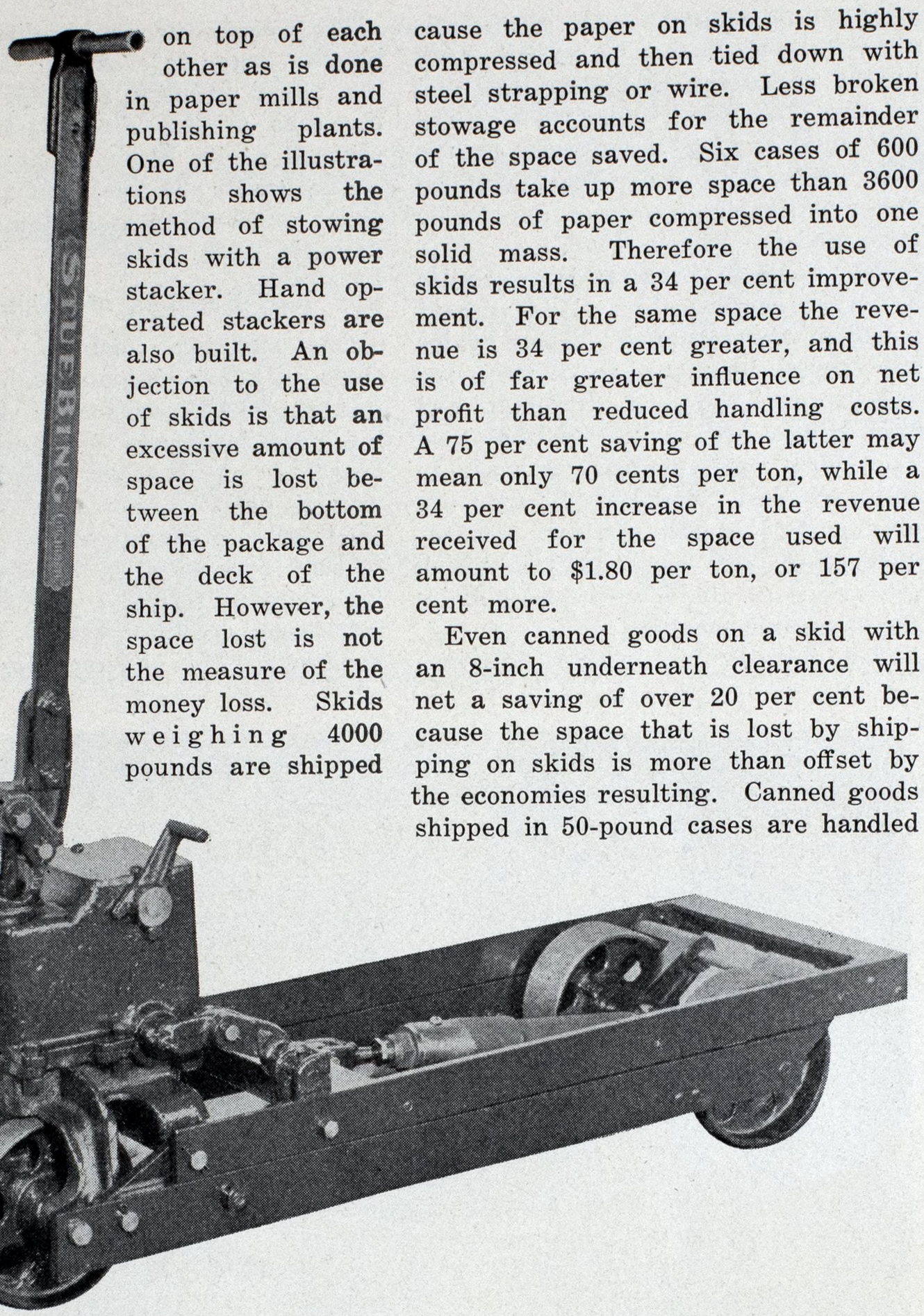
Experiments in handling freight on skids between railroad terminals and piers of shipping companies have been successfully made and will be extended as fast as equipment can be obtained. Experiments are contemplated involving the stowage of skids



5000-POUND POWER STACKER STACKING SKIDS OF PAPER

on top of each other as is done in paper mills and publishing plants. One of the illustrations shows the method of stowing skids with a power stacker. Hand operated stackers are also built. An objection to the use of skids is that an excessive amount of space is lost between the bottom of the package and the deck of the ship. However, the space lost is not the measure of the money loss. Skids weighing 4000 pounds are shipped by the Oxford Paper Co., Rumford, Me., and measure 58.7 cubic feet, or 29 cubic feet to the ton. The same grade of paper in cases weighing 600 pounds measures 44 cubic feet per ton. This is largely because the paper on skids is highly compressed and then tied down with steel strapping or wire. Less broken stowage accounts for the remainder of the space saved. Six cases of 600 pounds take up more space than 3600 pounds of paper compressed into one solid mass. Therefore the use of skids results in a 34 per cent improvement. For the same space the revenue is 34 per cent greater, and this is of far greater influence on net profit than reduced handling costs. A 75 per cent saving of the latter may mean only 70 cents per ton, while a 34 per cent increase in the revenue received for the space used will amount to $1.80 per ton, or 157 per cent more.

Even canned goods on a skid with an 8-inch underneath clearance will net a saving of over 20 per cent because the space that is lost by shipping on skids is more than offset by the economies resulting. Canned goods shipped in 50-pound cases are handled 40 times more than if combined into a unit of 2000 pounds.



LIFT TRUCK WITH CHECKING CYLINDER IN HORIZONTAL POSITION

Steel sheets can be handled with much greater economy on skids. From the time a carload arrives on the dock at Baltimore or Philadelphia until it is loaded into a railroad car at a Pacific coast port, each individual sheet is handled six times. Damage to the shipment due to rust and bent edges would be practically eliminated if shipments were made in unit loads held on skids with steel strapping and covered with waterproof paper. An automobile factory in Detroit reduced the cost of handling sheet steel from $5.10 a ton to 82 cents a ton by packing the sheets in ten-ton units. Of this saving $2.62 a ton represents damage chargeable to the railroad.

Tin plate in unit loads of 3000 pounds is handled successfully into and out of box cars at manufacturing plants by the lift truck equipped with a fork, 1½ inches high instead of the usual platform. The tin plate is first placed in a fiber carton. This is strapped to three wooden runners 2 or 3 inches high. Such unit loads or skids moving via water lines would cause very little loss of space. Plans for the use of similar skids for canned goods are being considered by at least one concern. These skids would have runners 4 inches wide so as to properly distribute the weight when the skids are tiered.

Examples of the skid and lift truck method are obtainable from a large number of concerns operating under many different conditions. When railroad cars and street trucks are loaded or unloaded at marine terminals, through shipments on skids are handled with amazing reductions in costs. Detailed figures of the economies effected in this phase of a marine operation are not available but the savings resulting and the possibilities of this method are indicated by the savings obtained by other industries doing the same character of work.

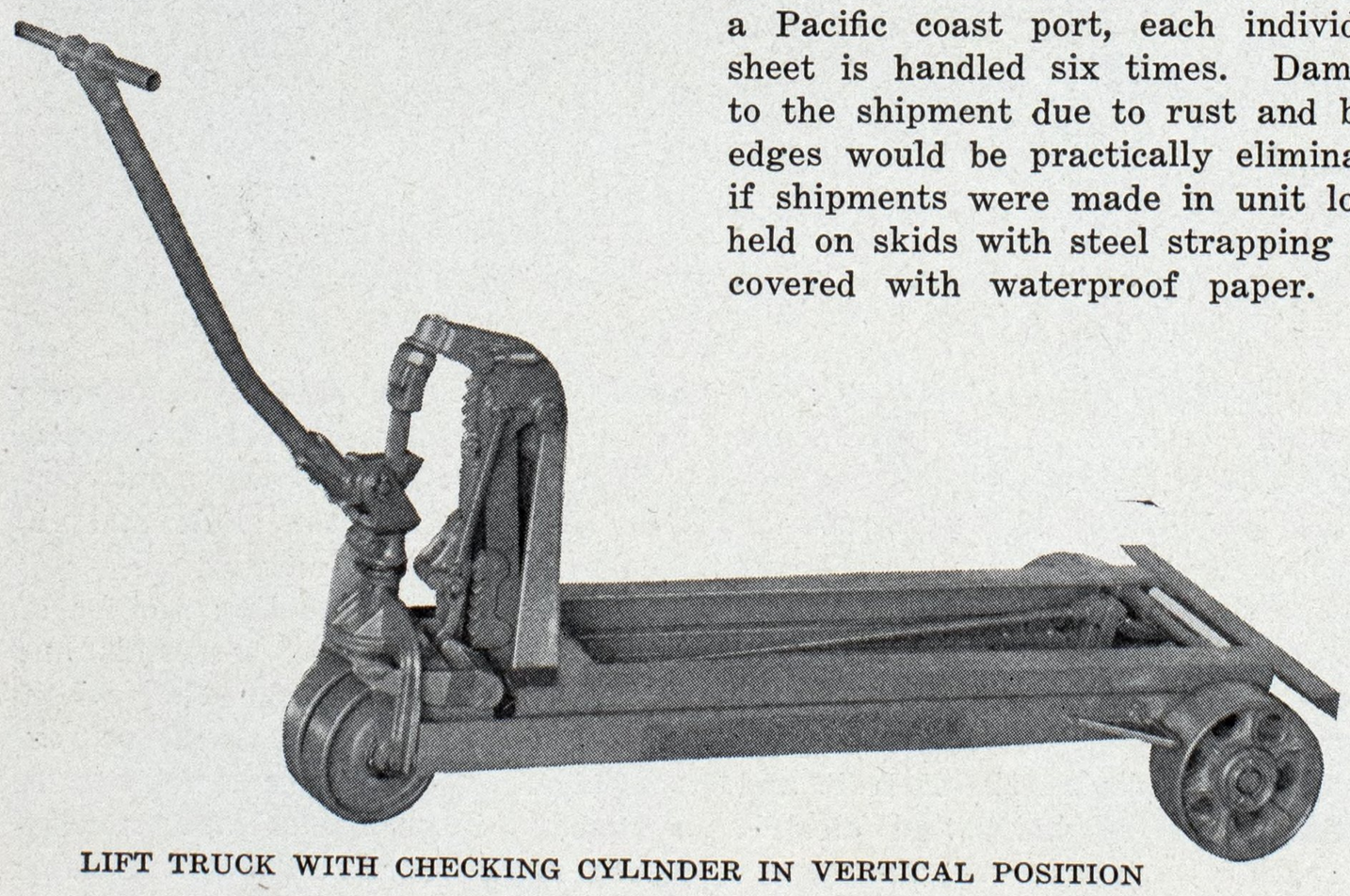
Loading Time Greatly Reduced

Skids and lift trucks have made it possible for the Cincinnati Milling Machine Co. to cut car loading costs 84 per cent. The West Virginia Pulp & Paper Co. has reduced handling expenses 80 per cent and at the same time have cut packing expenses 77 per cent by the use of skids and lift trucks. This company's paper is now shipped on a skid costing $2.25, whereas formerly the same amount of paper required packing cases costing $10.

The Champion Coated Paper Co. reduced the time for loading a car from 21 man hours to 1½ man hours by the use of this equipment. Part of this saving was due to the less time required to secure the load in the car.

The Hupp Motor Co., Detroit, receives crank shafts on rack skids which hold 72 crank shafts. Before the skids and lift trucks were installed it took 7½ hours to unload a car of crank shafts at a cost of $24. Now a lift truck does the work in 45 minutes, at a cost of 98 cents, a reduction of 95.9 per cent.

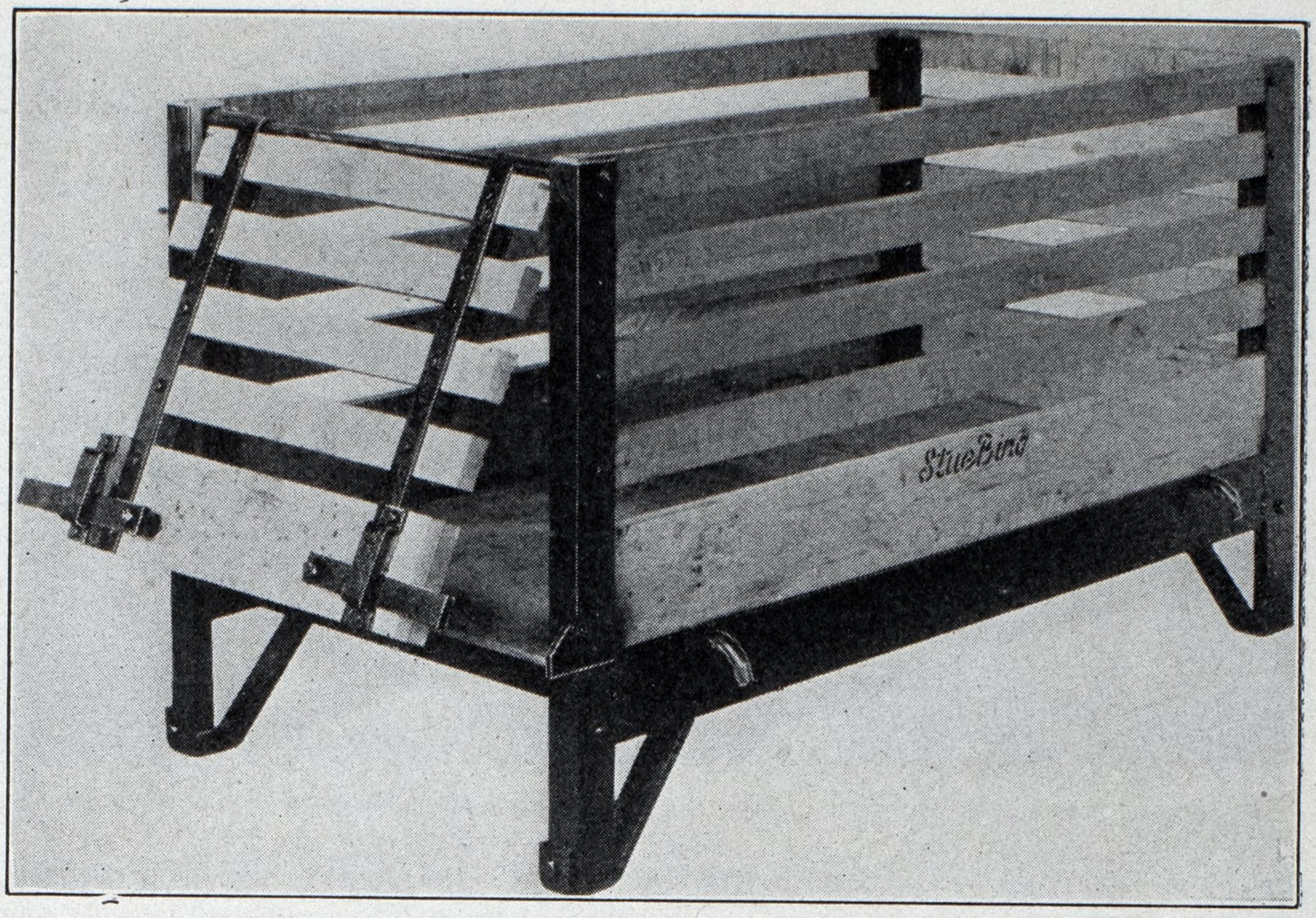
Extending the use of skids in the shipping industry, for through shipments, will result in a distinct gain for



LIFT TRUCK WITH CHECKING CYLINDER IN VERTICAL POSITION

all concerned. The shipper saves from 25 to 90 per cent of his handling costs; also he saves time and in some cases cuts packing expenses 75 per cent and more. The railroad and trucking companies benefit by quicker dispatch of their equipment and by less claims. The shipping company saves 40 per cent and more of cargo handling costs, obtains quicker dispatch of the ship, has less claims and less expense for checking and sorting.

As a further step in the adaptation of pulverized coal burning to seagoing vessels, a contract has been entered into with the Todd Dry Dock, Engineering & Repair Co., New York, by the United States shipping board Merchant Fleet Corp. to convert the S. S. WEST ALSEK from a hand-fired coal-burning vessel to a pulverized coal-burning vessel.



SLATE BIN TYPE OF SKID FITTED WITH HOOKS FOR HOISTING

Power Equipment Cuts Terminal Costs

THE Southern Pacific steamship lines (Morgan line) terminal at New Orleans is a good example of the use of gasoline lift trucks in reducing stevedoring costs. The savings, compared with hand trucks, have been large enough to pay off the investment in only 14 weeks. This is a remarkable result for a $2300 piece of equipment, and was made possible by moving cargo in larger units at a faster speed.

The first modern equipment to be used on this terminal were three flat bed or burden carrying trucks acquired in 1913. These trucks were used primarily in loading freight into cars when long hauls were necessary. In 1925 consideration was given to the use of power trucks in loading and discharging ships. Lift trucks were decided upon as being better suited to the conditions at the terminal than the flat bed type. The limited wharf space made it advisable to reduce the equipment units to the lowest number possible, consistent with economical operation. A total of six 3-ton electric lift trucks were purchased. These were supplemented by two electric tractors and 17 trailers for long hauls.

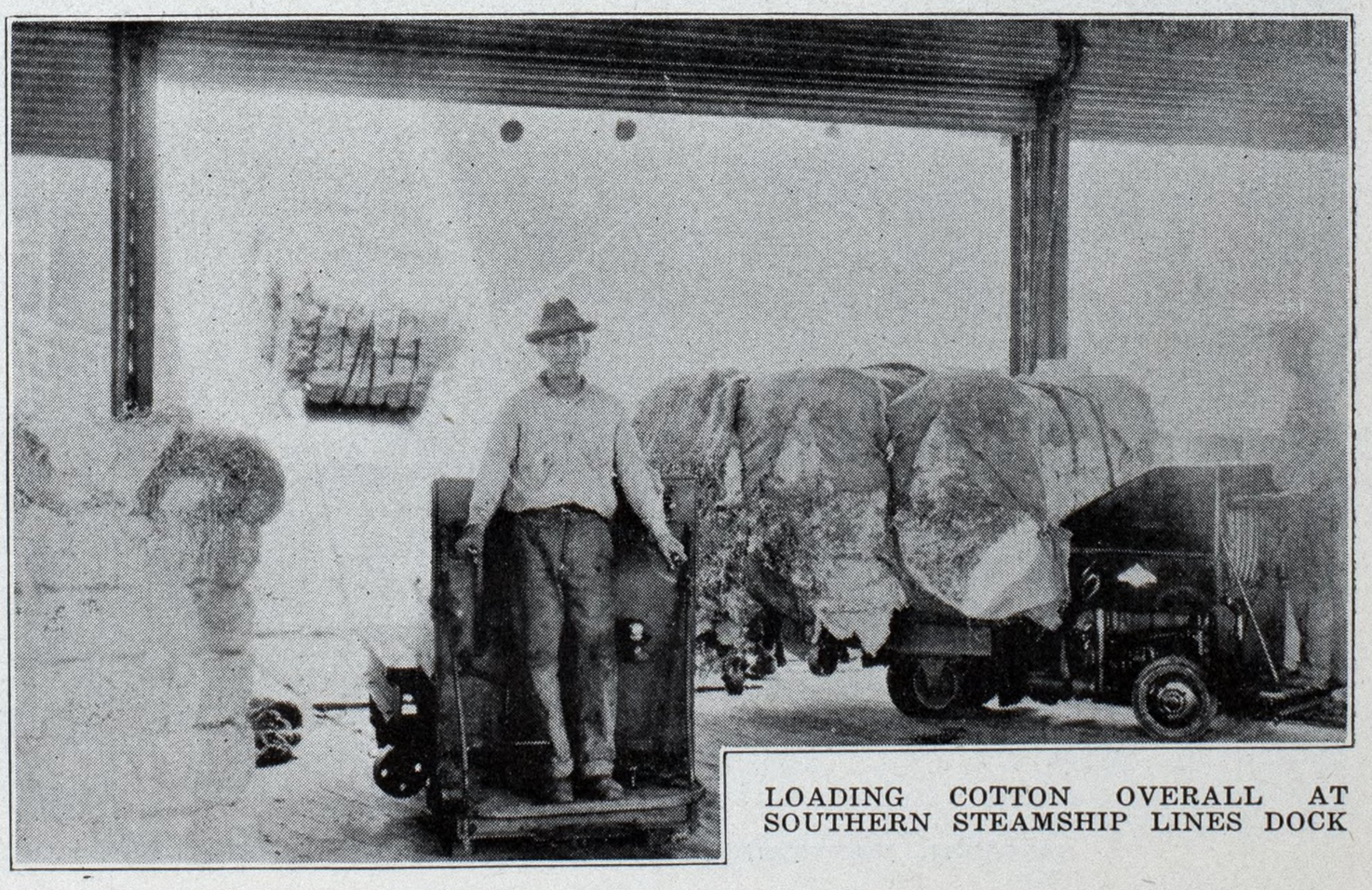
Power Equipment Increased

The volume of freight passing through the terminal increased steadily, making necessary the acquisition of additional power units. After an investigation the management decided in October, 1927, to buy two 3-ton capacity gasoline lift trucks. In February, 1928, two additional units were purchased. Since that date the gasoline propelled equipment was increased to eight lift trucks, and further purchases are contemplated.

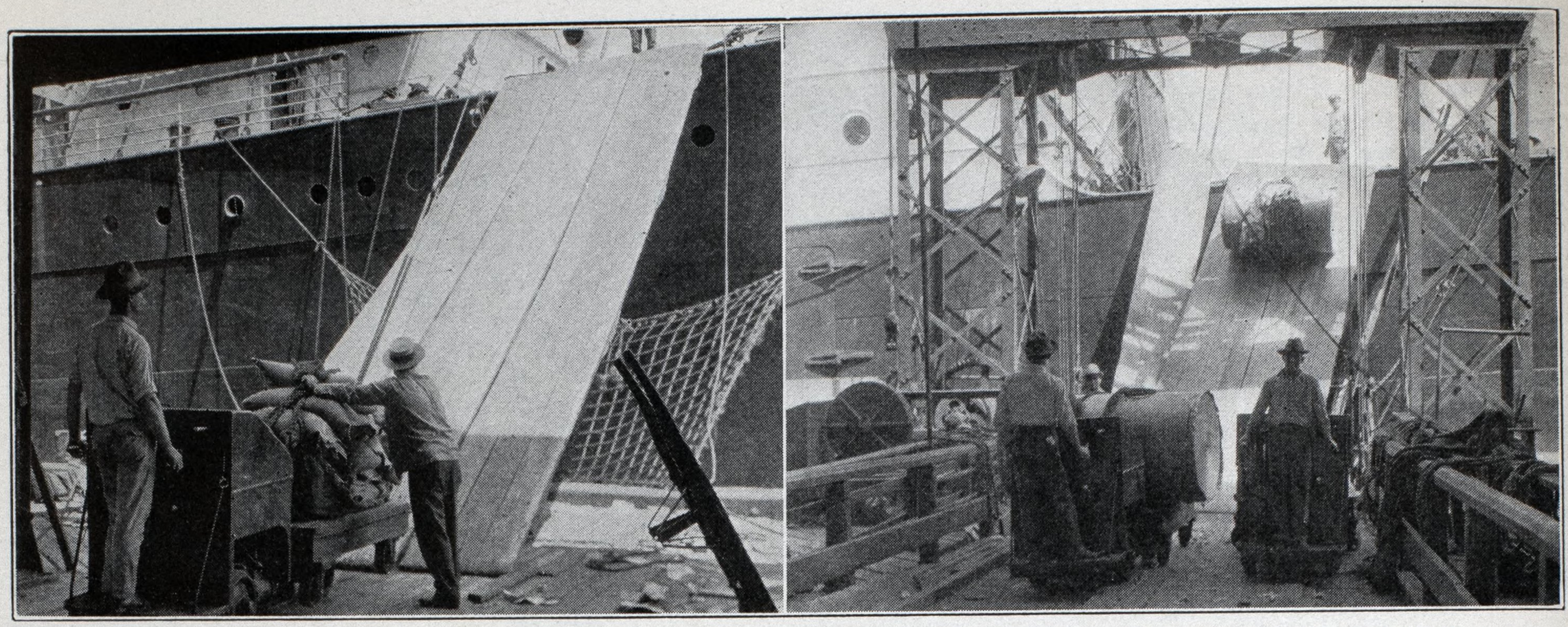
This terminal handles approximately 500,000 tons of carload and less than carload cargo each year which is carried by the ships of the New York New Orleans line. The ships are provided with overall hatches and with side ports. Variations of the river level, from 0 to 23 feet above the Carrollton gage, make it impossible to operate the lift trucks through the side ports but a small percentage of the time. Hand trucks are used in conjunction with escalators for handling cargo through the side port when the power equipment is not used.

Inbound carload shipments from New York are taken direct into cars. Less than carload freight having numerous marks must be segregated on the dock. The cargo is discharged on skids. These are moved by lift trucks to the "bunch pile." There the freight is segregated according to consignees and connecting carriers and placed on dead skids. These skids are arranged around the "bunch pile."

Outward freight is delivered from railroad cars and street trucks. The cars are unloaded by outside contractors. When the ship starts to load, drafts are made up at the pile. Airplane, rope or other slings are used, depending on the character of the cargo. To avoid rehandling at the tackle, the slings are placed on a skid which is moved to the ship's



LOADING COTTON OVERALL AT SOUTHERN STEAMSHIP LINES DOCK



GASOLINE LIFT TRUCKS—3-TON CAPACITY—USED BY SOUTHERN PACIFIC STEAMSHIP LINES AT NEW ORLEANS

side by a lift truck and there hoisted into the ship.

The average skid load is about one ton. The full capacity cannot be utilized because of the bulky nature of the cargo. While costs can be reduced by keeping freight on skids while on the dock awaiting delivery to consignee or loading into the ship, this is not done on the New Orleans terminal because of the limited wharf area which makes tiering of freight necessary.

Self-Contained Power Unit

An important factor in the management's decision to buy the gasoline lift trucks was the self-contained power unit of these trucks, which eliminates the necessity of a charging set and spare batteries, making it convenient to use the trucks in loading and discharging ships at docks distant from the regular terminal.

Another important factor in their decision was the sturdy construction of the truck which made them best suited to the heavy service required. The three-point suspension of the steering axle enables the truck to operate over uneven floors, ramps or roadways without subjecting the frame and platform to any distortion. The rubber-tired wheels are a further aid to keeping the maintenance charges low. The power is supplied by a four-cylinder water-cooled engine. The hydraulic lifting mechanism elevates the lifting platform with a capacity load of three tons, in eight seconds.

A survey of the use of lift trucks at the New Orleans terminal of the Southern Pacific Co. by the A. C. Nielsen Co., a firm of neutral engineers, provided the following information of the cost of operating the gasoline truck:

Hourly Truck Operating Costs

Fixed charges—Depreciation 7 year basis 6% interest—(2860 hours of operation per year)	$.143
Repair and maintenance costs: $110 allowance/2860 hours (Records not available)	0.38
Gasoline	.104
Lubrication and tending service	.130
Total hourly operating cost	**$.415**

The eight gasoline lift trucks which saved enough, as compared with hand trucks, to pay for themselves in 14 weeks accomplished this result because with a low hourly cost they carried a larger unit of cargo at a faster speed. After paying for the investment, the trucks cleared $2300 every 14 weeks, an annual return on the investment of over 270 per cent.

Board Sells Waterbury

Sale of the S. S. WATERBURY to the Export Steamship Corp. was approved by the shipping board Feb. 12. The price, including repairs which the purchaser agrees to perform on the vessel is $67,656. The vessel is to be completely reconditioned within six months and will be used as a reserve ship for the Export line fleet.

The WATERBURY is a steel cargo ship of 8727 deadweight tons, equipped with Westinghouse turbines and B. & W. oil burning boilers.



GASOLINE LIFT TRUCKS CARRYING LIVE SKIDS, SOUTHERN PACIFIC LINES AT NEW ORLEANS

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	528	2,416,692	543	2,385,658
December	554	2,369,709	559	2,342,928
November	516	2,237,046	550	2,418,097
October	596	2,666,360	589	2,571,403
September	545	2,424,887	543	2,362,154
August	580	2,533,877	622	2,733,727
July	602	2,526,107	564	2,415,168
June	537	2,386,509	602	2,645,954
May	580	2,498,280	590	2,463,196
April, 1928	566	2,487,959	541	2,359,979

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	86	243,505	63	187,612
December	106	309,214	72	213,261
November	88	229,598	36	89,931
October	91	250,902	48	137,352
September	84	238,234	43	122,389
August	96	266,104	58	161,365
July	101	254,378	60	143,573
June	101	270,069	72	183,534
May	110	281,648	74	179,108
April, 1928	109	261,735	60	140,547

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	94	294,036	47	164,132
December	100	312,100	69	214,047
November	107	315,954	74	214,574
October	112	347,432	72	221,761
September	113	383,749	77	245,068
August	130	340,569	107	270,757
July	155	378,368	111	289,121
June	143	319,611	100	254,906
May	134	204,575	103	231,851
April, 1928	110	343,360	65	205,257

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	20	59,830	21	61,434
December	25	61,251	25	62,930
November	20	37,250	19	33,408
October	23	39,959	22	40,588
September	30	53,338	30	51,018
August	30	48,256	28	47,078
July	38	68,208	38	66,389
June	30	40,255	25	33,834
May	23	26,648	19	28,673
April, 1928	20	51,854	19	50,175

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	7	24,095	4	17,289
December	6	20,741	8	32,974
November	10	35,147	9	20,551
October	6	14,667	9	20,551
September	5	18,895	3	12,777
August	7	28,611	4	19,978
July	8	26,920	7	25,451
June	8	35,177	7	25,741
May	7	21,068	4	12,765
April, 1928	4	15,670	3	12,362

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1928	39	144,128	56	205,572
November	30	115,469	53	198,195
October	42	154,623	62	224,018
September	41	150,368	57	203,758
August	35	136,504	47	172,693
July	30	111,042	46	157,354
June	23	85,328	40	144,572
May	25	96,976	44	159,070
April	37	137,821	41	152,042
March, 1928	29	111,490	49	170,655

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	126	386,102	122	372,302
December	127	392,832	134	400,355
November	134	412,100	134	417,523
October	133	402,263	131	406,142
September	119	374,500	128	396,749
August	133	404,303	144	440,016
July	128	378,827	121	353,758
June	127	392,580	135	412,620
May	135	413,038	151	439,278
April, 1928	140	396,942	134	394,124

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	18	36,737	61	154,970
December	32	73,123	90	223,258
November	19	58,171	77	209,023
October	12	33,817	66	173,729
September	21	64,366	69	178,508
August	19	50,096	83	208,639
July	15	33,548	81	212,471
June	19	42,454	63	155,944
May	25	58,472	78	207,857
April, 1928	15	35,122	81	189,564

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1928	26	64,406	27	67,621
October	23	55,147	22	53,094
September	40	89,032	42	94,981
August	37	85,186	34	83,694
July	30	81,634	31	79,222
June	26	54,449	28	57,111
May	26	58,800	28	63,779
April	26	68,581	26	61,939
March	25	65,435	28	68,630
February, 1928	31	70,881	28	58,896

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	82	98,373	79	99,243
December	79	79,816	72	79,354
November	98	81,666	101	82,863
October	120	111,450	116	106,139
September	84	60,079	86	62,698
August	91	73,771	89	69,532
July	86	65,838	88	67,720
June	98	83,417	93	78,006
May	134	117,930	129	112,303
April, 1928	101	75,140	102	76,450

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1928	100	234,963	89	212,341
November	91	203,865	77	184,537
October	89	185,031	71	166,606
September	85	209,709	74	193,661
August	90	186,097	78	178,036
July	101	209,990	82	189,008
June	85	176,088	82	178,337
May	102	227,194	90	209,449
April	114	217,803	105	203,515
March, 1928	107	242,444	97	246,634

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	60	242,464	73	290,077
December	62	249,729	63	259,823
November	68	285,564	75	306,605
October	62	245,420	60	243,778
September	57	229,718	66	254,503
August	55	220,858	53	228,378
July	64	261,850	58	228,946
June	44	180,482	44	185,765
May	53	206,254	61	239,241
April, 1928	56	226,257	54	210,908

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	273	710,969	282	744,078
December	274	762,019	260	690,010
November	252	690,157	263	716,105
October	259	682,184	329	627,989
September	228	617,636	248	661,643
August	264	667,055	265	690,341
July	260	659,457	245	615,234
June	253	615,672	263	640,136
May	263	671,333	261	647,504
April, 1928	254	656,537	265	666,345

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
December, 1928	20	46,569	17	43,041
November	22	56,983	22	50,043
October	24	59,136	26	61,673
September	21	60,956	22	54,537
August	24	62,574	26	63,874
July	26	59,204	27	61,976
June	17	37,881	20	41,123
May	29	71,467	32	78,731
April	26	60,165	21	52,590
March, 1928	29	79,789	27	67,472

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	45	133,396	106	347,297
December	45	129,285	107	355,592
November	49	150,205	109	351,063
October	41	110,825	135	420,534
September	26	69,433	98	313,816
August	31	91,959	78	261,804
July	41	91,686	68	196,424
June	20	52,884	64	210,110
May	35	96,852	44	126,027
April, 1928	32	85,685	43	132,534

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	193	581,357	191	536,504
December, 1928	199	551,301	154	487,064
November	209	541,906	179	514,647
October	221	568,910	216	515,889
September	188	504,630	189	482,133
August	164	539,454	160	514,978
July	153	547,612	131	485,817
June	152	434,811	114	428,885
May	236	545,132	150	478,553
April, 1928	183	519,918	184	498,424

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1929	135	587,423	142	560,239
December	155	607,902	152	582,612
November	157	504,269	157	589,810
October	165	620,117	155	596,750
September	180	623,999	175	579,262
August	185	674,832	164	643,965
July	147	662,437	122	454,802
June	149	567,839	141	539,600
May	174	869,626	175	625,910
April, 1928	157	580,506	150	565,111

Port Arthur

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1928	24	78,538	33	109,230
June	25	80,481	25	79,758
May	27	92,323	28	90,108
April	24	73,693	26	88,253
March	46	127,039	47	131,741
February	47	144,273	44	144,508
January	20	69,947	20	72,185
December	23	67,105	21	68,602
November	21	64,277	25	80,084
October	18	50,632	25	82,177
September, 1927	16	51,492	29	83,728

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance, additional vessels in the foreign trade in this category were 40 of 141,279 net tons entered and 62 of 212,643 net tons cleared for the month of January.

Up and Down the Great Lakes

Change to Self-Unloader — Lake Levels — Shipmasters Convene — Wins Decision—Re-elect Officers—New Bulk Freighter—Ferry in Ice

ENGINEERS and attorneys for the Chicago sanitary district have prepared briefs and reports for the hearing on March 25 in Chicago before Charles Evans Hughes, special master in chancery, appointed by the United States Supreme Court, so that details may be worked out on water diversion from Lake Michigan, pending the final court decision. At the March 25 hearing, representatives of the complainant Great Lakes states in the water diversion case will be in attendance to present arguments and briefs.

An important question to be decided at the hearing will be the period which the Chicago sanitary district shall be granted for construction of sewage disposal plants as a substitute for diversion from Lake Michigan for sewage purposes.

The Chicago sanitary district has three new sewage plants under way. Philip Harrington, assistant chief engineer for the district, states that these plants cannot possibly treat Chicago sewage 100 per cent, however, and that the best that can be hoped for is approximately 90 per cent sewage treatment. The possibility of breakdown also must be considered, he said, which might result in only 40 to 50 per cent treatment.

Engineers have been selected by the Chicago sanitary district to survey the needs for sewage treatment in order to show what construction still is necessary to comply with federal government requirements. These engineers are working with Edward J. Kelly, chief engineer of the district. The engineers have been preparing reports for the Chicago sanitary district trustees on the necessary construction work and these findings are to be used in the hearing.

Change to Self-Unloader

The barge MAIDA of the Pringle Barge Line Co., is to be converted into a self-unloader by the Interlake Engineering Co., according to announcement made Feb. 11.

The MAIDA, which is to be towed from Buffalo to Cleveland as soon as navigation opens, is to be practically rebuilt according to plans and specifications prepared by the Interlake Engineering Co. and H. N. Harriman of the United States shipping bureau.

There is to be an installation of the four-belt system of self-unloading, power for which is to be supplied by a Busch-Sulzer diesel engine driving electric generators, which will drive the machinery.

The MAIDA was built in 1898, has a 376-foot keel, 46-foot beam, a depth of 26 feet and capacity of 6300 tons. When completed, she will be the second self-unloader in the Pringle line. The CONSTITUTION is the other. They are for operation in the St. Clair and Detroit river coal trade.

January Lake Levels

The United States Lake Survey reports the monthly mean stages of the Great Lakes for the month of January as follows:

Lakes	Feet Above Mean Sea Level
Superior	602.61
Michigan-Huron	580.57
St. Clair	575.35
Erie	571.83
Ontario	245.85

Lake Superior was 0.29 foot lower than in December and it was 0.48 foot higher than the January stage of a year ago. Lakes Michigan-Huron were 0.06 foot lower than in December and they were 1.83 feet higher than the January stage of a year ago, 1.55 feet above the average stage of January of the last ten years. Lake Erie was 0.03 foot higher than in December and it was 0.17 foot higher than in January stage of a year ago. Lake Ontario was 0.05 foot higher than in December; and it was 0.19 foot lower than the January stage of a year ago, 0.77 foot above the average stage of January of the last ten years.

Shipmasters Convene

The annual convention of the Grand Lodge of International Shipmasters association opened in Cleveland, Jan. 29.

Capt. F. N. Watts of Algonac, Mich., presided at the sessions, held at the Hollenden hotel. Among other officers in attendance were: Capt. A. P. Cartwright, Milwaukee, vice president; Capt. F. M. Morgan, Chicago, secretary, and Capt. J. H. McDonald, Marine City, treasurer.

Attending the convention were delegates from the various lodges along the Great Lakes from Duluth to Buffalo, as well as quite a number of visitors.

Election of officers was held and the following were chosen: Capt. A. P. Cartwright, Milwaukee, grand president; Capt. John Crerar, past president of Cleveland Lodge No. 4, was elected first vice president, and Capt. D. M. Crooker of Port Huron, second vice president. Capt. John H. McDonald of Marine City and Capt. F. M. Morgan of Chicago were reelected secretary and treasurer, respectively. An elaborate program of entertainment was carried out during the evenings and was climaxed Friday evening, Feb. 1, with the grand ball in the Hollenden ballroom. Various resolutions were considered during the session.

Paisley Wins Decision

Word was received, Feb. 14, by A. E. R. Schneider, manager of the Paisley Steamship Co., which owns the steamer ROBERT J. PAISLEY, that the judgment of the Toronto admiralty court fixing blame for sinking of the SASKATCHEWAN at Owen sound, Jan. 17, on the PAISLEY, was reversed by the supreme court of Canada.

Suits were filed by the Canada Steamship lines and Richardson & Son, owners of the cargo against the PAISLEY, the damages asked aggregating $80,000. The lower court found the PAISLEY negligent in having the anchor exposed and for not stopping when it was noted that she was drifting into the SASKATCHEWAN.

The supreme court, the five judges unanimous, reversed the lower court's decree and held the tug SASKATCHEWAN entirely responsible.

It is reported that the plaintiffs in the case propose to carry an appeal before the privy council in England.

Lake Shipping Man Dies

William J. Garland, aged 60, who had been in the freight service of lake steamship lines for many years, died Jan. 24 at a hospital in Chicago. He had been with the Goodrich Transit Co. lines for 20 years, for the past eight years having been freight traffic representative for the Goodrich company

on the northwest side of Chicago. Mr. Garland was a native of Traverse City, Mich., and during his early years he served as assistant purser on the CITY OF CHARLEVOIX, operated by the Northern Michigan Transit Co., later becoming purser of the FRONTENAC, owned by the Peoples Transsit Co., which operated between Chicago and Ludington, Mich. He also saw several years of service with the Barry line as general foreman of that line's warehouse in Chicago. He joined the Goodrich lines in 1906 as a checker in the warehouse, later becoming freight cashier at the Chicago docks before being promoted to Chicago freight traffic representative. Burial was in Traverse City, Jan. 26.

Re-elect Officers

Officers for the coming year were elected at a meeting of the board of the Great Lakes Towing Co., Feb. 12. H. E. Gilpin was elected president; G. A. Tomlinson, vice president, and M. H. Wardwell, secretary-treasurer.

Three new members were elected to the board. H. S. Pickands, of Pickands, Mather & Co., also of the Interlake Steamship Co., succeeds the late Harry Coulby. James E. Davidson of Bay City, is successor to his father, the late Capt. James E. Davidson. The third member elected to the board was Capt. Joseph S. Wood of the Wilson Transit Co.

New Bulk Freighter

An announcement made Feb. 15 stated that two package freighters and one bulk freighter similar to the GLENEAGLES would be added to the tonnage of the Canada Steamship lines.

Work is to begin at the Midland Shipbuilding Co.'s yard at Midland, Ont., as soon as the package freighter is completed. The bulk freighter is expected to be in service by the middle of Septemebr.

Principal dimensions of the ship are: Length, 596 feet overall; beam, 60 feet; molded depth, 32 feet. The capacity of the vessel is given as 440,000 bushels and it will carry ore and coal in addition to grain. Power is to be by triple expansion engines, and three Scotch boilers with a working pressure of 190 pounds.

The freighter is to be the result of careful research on the part of the company. Embodying only the most modern equipment, she is to have six holds, rather than four, and is to have a single deck house forward, belief being that the double forward deck house retards speed in a head wind.

Order Detroit Fire Boat

The city of Detroit on Feb. 7, opened bids on an elaborate steel fire boat. The hull is to be of substantial steel construction and there will be a pumping capacity of 10,000 gallons at 300 pounds pressure. Propulsive machinery will be a steam reciprocating engine. Power for pumping will be furnished by steam turbines. Steam will be supplied by Babcock & Wilcox watertube boilers.

Toledo Shipbuilding Co. Inc. was the lowest bidder at $279,800. Other bids received were: American Ship Building Co. $283,750; Manitowoc Shipbuilding Corp. $298,000; and Great Lakes Engineering Works, $298,750. Contract was awarded the Toledo Shipbuilding Co. Inc., Toledo, O.

Management Transferred

In order to centralize operations, the Bethlehem Steel Co., a substantial owner in the Mahoning Steamship Co., placed the operation of the Mahoning Co.'s vessels, the WILLIAM H. DONNER, the LEONARD C. HANNA and the POWELL STOCKHOUSE, with the lake subsidiary of the Bethlehem company, the Bethlehem Transportation Co. with offices in Cleveland.

Canal Draft a Handicap

BECAUSE the New York State barge canal does not have its full statutory depth of 12 feet, two modern diesel electric vessels TWIN PORTS and TWIN CITIES, are unable to carry a profitable load and will probably be discontinued, according to T. H. Hoopes, secretary of the Detroit and New York Transit Co., who has been operating the boats.

The all water service from the lakes to the sea was first started by the Minnesota-Atlantic Transit Co. in 1923 on a run between New York and Duluth, Minn. The route was shortened in 1925 to a run between Detroit and New York. The Minnesota-Atlantic Transit Co. operated this line until 1927 when the Detroit and New York Transit Co. was formed as a subsidiary of the Terminals and Transportation Corp., which is also the parent organization of the Minnesota-Atlantic Transit Corp.

It was thought that the Great Lakes and canal route to the seas would be a profitable one because of the economical operation of the 2600-ton diesel electric vessels.

Both east and west shippers appreciated the savings of the all water route connecting the Atlantic seaboard with the Great Lakes territory. The business increased to the point where it was about to become profitable only to reach a capacity limit because of the shallowness of the New York State barge canal, the statutory depth of which is 12 feet but which is only about 11 feet in many places.

"We are reluctant to discontinue this service," said Mr. Hoopes, "but we have absorbed about all the loss that we can stand on the operation of our motorships under the extremely disappointing shallow draft conditions of the canal. The tonnage of a common carrier is bound to vary from one sailing to the next. The shipping business seems to be either a feast or a famine. This is expected and in ordinary operations the low spots can be overcome by taking full advantage of the high spots but in the New York State barge canal operation where we have never been able to go deeper than 10 feet 9 inches and usually not more than 10 feet 6 inches, we are severely handicapped when a plentiful volume of freight is offered.

"At the present time, our motorships are laid up in New York harbor. Whether we will operate this year is still undecided. We are still hopeful that some day the division of canals and waterways of New York State will provide the full statutory depth of 12 feet."

Since the origin of the lakes to sea canal idea a century or so ago, many have thought that the federal government should operate it and there are still some who think that the United States should take over the canal, deepen it and make other improvements as the first step toward a practical and economical lake to sea waterway.

The diesel electric vessels TWIN PORTS and TWIN CITIES were designed by Henry Penton and were built in the shipyards of the Great Lakes Engineering Works at Detroit, in 1923. At the time the service was started it was acclaimed by both eastern and western traffic men as it provided a direct route between the coast and inland ports at a saving of approximately 25 per cent over all rail routes. Time of delivery is definitely established by schedule.

Personal Sketches of Marine Men

Capt. J. H. Tomb, Commanding Officer, New York State Nautical School

By Robert D. MacMillan



—Photo by Blank & Stoller

HIS long service in the navy and varied experience afloat and ashore particularly fit him for supervising the training of future officers of the American merchant marine.

COMPETITION for the ocean carrying trade is so keen that no measure of success can be expected without trained leaders. To turn out such leaders in his constant objective.

THE foundation for doing this work is well laid as demonstrated by the records and achievements of past graduates from the school of which he is now head.

CAPT. JAMES H. TOMB the subject of this sketch, as superintendent and commanding officer of the New York State Nautical school, represents and is responsible for a force of untold power in the rehabilitation of the American merchant marine. Where he was born and when he was born has not been established by the writer nor have any facts been culled as to his early youth. It is known however that he graduated from the United States Naval academy in 1899 and that in the thirty years which have elapsed he has seen hard sea service in the navy of Uncle Sam all over the world. He served in two wars in posts of responsibility and sometimes of great danger as for instance while in command of the U. S. S. AROOSTOOK, a unit of mine squadron one which laid mines across the North sea in 1917 and 1918. For this service he was awarded the distinguished service medal.

An old sea dog, with a good head on his shoulders, trained and disciplined in what we like to think is the best naval school in the world, Captain Tomb has not permitted a natural bent for action to destroy his taste for study, as the record shows he was at one time a student at the Naval War college. And parenthetically it may be said that only naval officers with hard heads and good minds ever attempt to do anything with the Naval War college. His official record in the navy reads much the same as that of many other naval officers of his class. He served during the Spanish-American war on the MARBLEHEAD. Then followed regular service details to this ship and that until the Great war. After the war, and before his own request to be retired from active service in November 1925, Captain Tomb served as commandant of the naval air station at San Diego, Calif.; commander of a destroyer squadron; captain of the yard of the Puget Sound navy yard; and marine superintendent of the Panama canal. He was appointed superintendent and commanding officer of the New York State Nautical school, the name of which has recently been changed to the New York State Merchant Marine academy, in June 1927.

Though Captain Tomb has occupied positions of high responsibility he has never occupied one of higher responsibility than that of director of the education and character building of the future officers of the merchant marine. He has in back of him the fine tradition established through service of the graduates of the Nautical school of the State of New York. The strength of this tradition was well illustrated in the quality and quantity of the alumni which attended the silver anniversary banquet of the alumni association on Feb. 9.

A modern gunboat, the composite steel and wood barkentine NEWPORT, 1010 tons, equipped with both sail and steam, is doing duty as the New York merchant marine training ship. Her complement consists of 110 cadets appointed after competitive examinations throughout the state of New York. Officers, instructors and crew of this vessel number 30. Applicants for enrollment as cadets must be between the ages of 17 and 21, must be graduates of high school, of sound constitution and free from physical defects. Furthermore they must be of good character and have a genuine desire to follow the sea. Instructions in deck and engine room departments is given by merchant marine or naval officers selected for their special qualification. Among the subjects taught are, mathematics, seamanship, naval construction, navigation, astronomy, international law and ships' business for the deck department's cadets. The engineering cadets

are given instruction in marine engineering, principles of mechanics, machine shop practice and engineering mathematics. All training is given aboard the training ship. Cruises are made to Europe each summer.

All who are acquainted with marine affairs know of the outstanding service contributed by graduates of New York State's Nautical school. During the war great numbers were enrolled as commissioned officers serving afloat and ashore with like devotion to duty and adaptability to the job in hand. Now in these peace times the training received serves them well in all kinds of marine activity. Everyone has heard of Chief Officer Manning, hero of the FLORIDA rescue; Capt. Paul C. Grening, who commanded the rescue of the crew of the Italian freighter, IGNAZIO FLORIO, while he was in charge of the PRESIDENT HARDING; Capt. Schuyler F. Cummings who saved the suvivors of the VESTRIS while he was in command of the AMERICAN SHIPPER; Capt. Felix Riesenberg, a real seaman and an author of note; Capt. Herbert Hartley, for over five years in command of the S. S. LEVIATHAN; Capt. Emory Rice, who sank the first submarine after the entry of America in the war, while he was in command of the MONGOLIA. In the news of today in marine affairs the name of Joseph Sheedy is one to reckon with, as he with associates have acquired the United States lines for private ownership and operation. All of the foregoing received their training both intellectually and morally at the New York Nautical school. And this is the tradition that Captain Tomb has to live up to and to try to improve upon.

A Diesel Tanker for Ocean and Lakes

THERE is now under construction at the yard of the Sun Shipbuilding & Dry Dock Co., Chester, Pa., a twin screw motor tanker to the order of the Sun Oil Co., Philadelphia, for ocean service. This vessel will also be used on the canal between Montreal and the Great Lakes.

The principal dimensions are as follows:

Length over all, feet inches	255 0
Length B. P., feet inches	246 6
Depth molded, feet inches	18 6
Deadweight in tons	2,350
Corresponding draft, feet, inches	15 6
Capacity of main cargo tanks in barrels	20,000
Speed in knots	9½

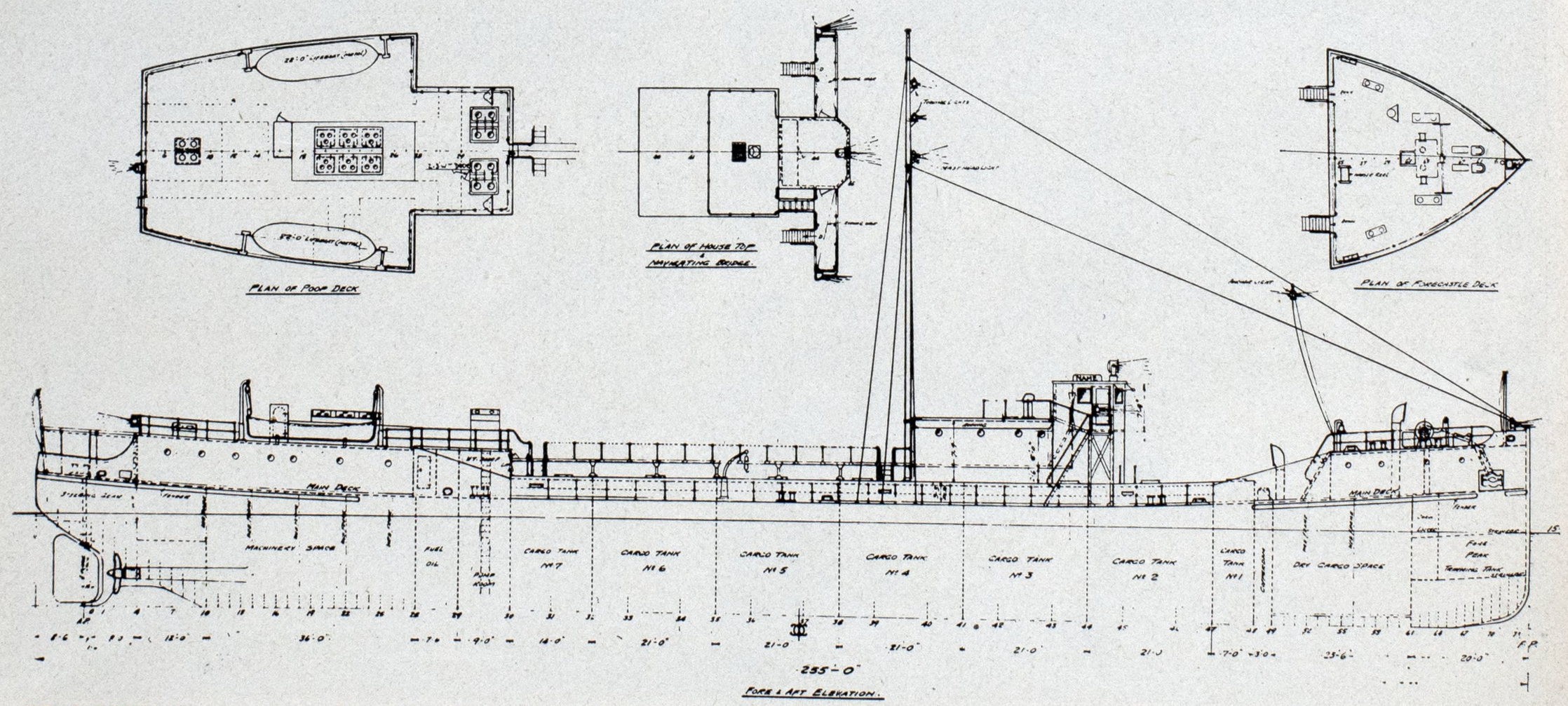
The tanker is of the single deck type with raised poop, top gallant forecastle and bridge deckhouse amidships. A continuous expansion trunk is fitted for the full length of the cargo tanks and the vessel is being built on the longitudinal "bracketless" system of construction with machinery aft. The fuel oil tanks and pump room are also located aft, and the dry cargo space forward. The fore peak is arranged as a trimming tank and the after peak is arranged for fresh water. The main cargo tanks, of which there are seven, are divided longitudinally by an oiltight centerline bulkhead, thus making a total of fourteen tanks.

Steel houses are fitted under the forecastle for boatswain's stores and lamp room. Midship steel houses are arranged for accommodations of captain, officers, hospital and wheelhouse. The engineers' and crew's quarters, mess rooms and cold storage rooms are arranged in the poop 'tween decks, all the rooms being large and well ventilated.

The vessel was designed and is being built by the Sun Shipbuilding & Dry Dock Co. She is entirely modern in every respect, having complete deck equipment, electric light plant, cold storage, hydro-electro steering gear, heating system, electric capstan, electric windlass, ventilating system and a cargo oil system arranged for rapid loading and discharging of liquid cargoes. Classification is to the highest requirements of the American bureau of shipping.

Machinery is located aft and the engine room is one of the most completely equipped for a tanker of this size. All of the engine accessories are separate, motor driven, and of dual capacity.

There are two six-cylinder Bessemer diesel engines of the direct reversible, one lever control type, model KR-6, 500 horsepower at 275 revolutions per minute, each directly connected to a propeller. The controls are located on the engine room floor level just aft of the camshaft chain drive housing. Kingsbury thrusts are located in the enclosed flywheel housing. The overspeed governor and lubricating oil automatic shut-off are also located in the after housing. On the forward end of the engine is located the enclosed worm gear barring over device. The 500-horsepower engines are Bessemer's latest type as installed in the New York State dredge, the



ARRANGEMENT OF TWIN SCREW DIESEL TANKER 255 FEET IN LENGTH—BUILDING AT SUN SHIPBUILDING & DRYDOCK CO.

motorship LIBERTY and the Norfolk county ferry. The crankshafts of the engines are of unusual size being 10 inches in diameter (both pins and mains) insuring no criticals up to 25 per cent above operating speed.

The equipment furnished with the engines is all motor driven and includes two 5-horsepower, all bronze centrifugal water pumps, the capacity of either pump being ample for both engines; two 3-horsepower motor driven lubricating oil pumps of dual capacity are also furnished; two 15-horsepower two-stage motor driven compressors are furnished and five 36 x 84-inch air tanks. The entire hull and equipment is to American Bureau of Shipping survey. All motor driven auxiliaries furnished by the Bessemer Engine Co. are variable speed and with push button controls.

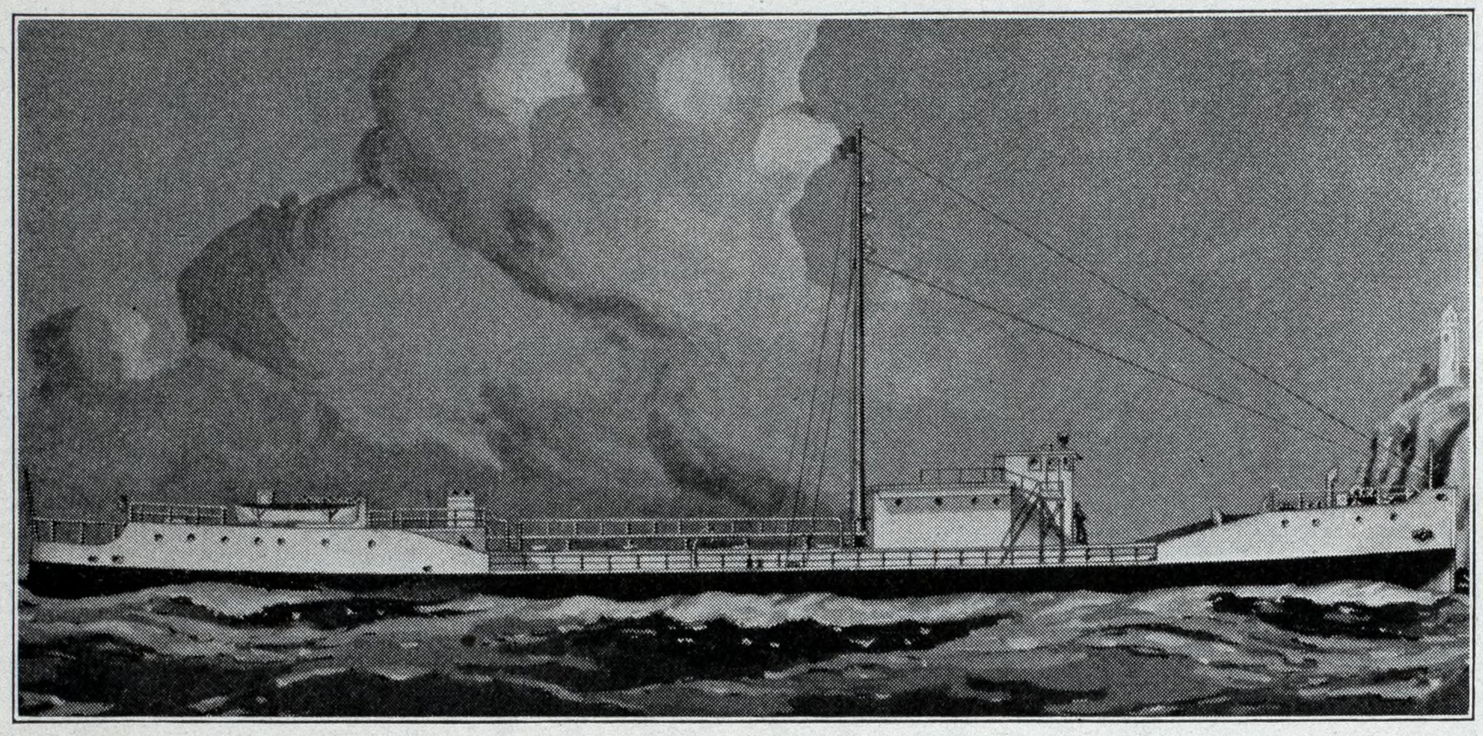
Fuel oil system is complete with duplex fuel oil strainers and built-in fuel pumps (the only accessory built in the engine). Lubrication oil system consists of duplex lubricating oil strainers, lubricating oil coolers, automatic cylinder lubricators and lubrication piping through drilled crankshaft and connecting rods to wrist pins.

Pyrometers, thermometers and visible water overflows are also provided as well as centrifuges.

Special attention has been paid to facilitate easy cleaning of cylinder jackets and heads of engines. Large cleanout plates, readily removable, are fitted. The one lever control enables one engineer to operate both engines. Considerable comment has been made regarding this control, as on a number of foreign built engines it is necessary to have two men for reversing one engine, with its four levers and five hand wheels.

The two generator engines are standard Bessemer 4-cylinder type of 75-kilowatt capacity, the same as furnished on the 13,500-ton diesel tanker SUN, which has one 80 brake horsepower Sun-Doxford engine for the main power.

Cargo lines will be of 8-inch diameter, suction and discharge, with 6-inch bell mouth suction in each tank fitted with 6-inch gate valves operated from deck. There will be two 8-inch suction lines on each side of center line bulkhead running full length of tanks and properly cross connected to pumps in pump room. Discharges at pump room will consist of two 8-inch lines port and two 8-inch lines starboard.



ARTIST'S SKETCH OF 255-FOOT TWIN SCREW DIESEL TANKER NOW BUILDING

Merchant Marine Needs

THE second national conference on the American merchant marine was held in Washington on Jan. 23 and 24. As a direct result of the conference a resolution was passed advocating legislation requiring a standard "load line" for American ships and a further resolution authorizing the postmaster general to increase the compensation to American ships, for carrying the mail when these ships meet foreign competition. The conference was attended by some 200 delegates including shipowners, builders, and technical experts.

The meeting was opened with an address by Chairman T. V. O'Connor, of the United States shipping board, following which Mr. O'Connor introduced Representative Wallace H. White, Jr., chairman of the house committee on merchant marine and fisheries and co-author of the merchant marine act of 1928.

Representative White called attention to the work which was done by congress during its last session in passing the Jones-White law providing aid for American ships. But he pointed out that conditions brought to light since the time of this law's enactment have made it seem obvious that further aid to American ships operated in foreign trades must be provided in order to enable American ships to meet the ever-increasing competition of foreign rivals.

Mr. White laid down four topics which, he said, should receive the favorable action of congress in the immediate future. Briefly, these topics are as follows:

1. Extension of mail contract provisions of the Jones-White act to provide surer aid to ships of higher speeds.

2. Special legislation to provide adequate aid for the distinctly cargo type ship.

3. Extension of the coastwise laws to the Phillipine Islands, as provided in the merchant marine act of 1920.

4. Discriminatory legislation against foreign vessels operated in the indirect trades of the United States, such as the operation of the Cunard ship CARONIA in the New York-Havana run.

"Speed," said Mr. White, "is an essential element, and perhaps a vital element, in communication and transportation. In the United States we are lagging far behind the efforts of our competitors in the building of ships of higher speeds."

Ship Men Elect Walker

H. B. Walker, former president of the old Dominion line and one of the leaders in the successful drive for the enactment of the Jones-White bill, was unanimously re-elected president of the powerful American Steamship Owners association, Feb. 13, at the annual meeting of the members, held in the offices of the association at 11 Broadway, New York city.

H. W. Warley, vice president of the Ore Steamship Co., subsidiary of the Bethlehem Steel Corp., was elected chairman of the association to succeed Gale H. Carter, president of the Grace line, while J. D. Tomlinson, vice president of the American Hawaiian Steamship line, was elected vice chairman. R. J. Baker was re-elected secretary-treasurer.

A fleet of 675 American vessels aggregating 3,082,000 gross tons is operated by members of the American Steamship Owners association.

Capt. James Davidson

(*Continued from Page* 34)

in vessels of the Davidson fleet, with only five lives lost.

Captain Davidson engaged in many enterprises outside of the marine field, and he gained the esteem and confidence of all with whom he had dealings. He was at one time president of the Old Second National bank of Bay City and was one of the incorporators of the Detroit Trust Co. For many years he was a director of the First and Old National bank of Detroit, now the First National bank. Several years ago he withdrew from all directorates except that with the Peoples Commercial and Savings bank of Bay City and the Great Lakes Towing Co. of Cleveland, of which he was an organizer. In the organization of this company, Captain Davidson acted as appraiser of properties for the firms entering the consolidation.

Funeral services were held at the family residence in Bay City, Mich., Thursday, Feb. 7.

Service by Radio

Three sketches of a steamship rudder and rudder stock were filed in London the other day for transmission by radio across the Atlantic ocean. A few hours later facsimile copies of the sketches were delivered by the Radio Corp. of America to the Kerr Steamship company's offices at 44 Beaver St., New York city.

On Saturday, Jan. 26, the cargo liner SILVER MAPLE, 9000 tons, sent a radiogram to the Kerr line offices in New York stating that its rudder stock had been damaged in the storm and that it needed assistance. Its position was about 700 miles from New York and 500 miles from Boston.

Two United States revenue cutters, the MOJAVE and the TAMPA were dispatched from Boston to render aid.

The following day, less than 48 hours after the original message was sent to London, the plans were on their way to the Sun Shipbuilding Co. at Chester, Pa. to enable them to proceed with the work on the new rudder stock for the SILVER MAPLE.

River Plate Line Bids

The shipping board, Jan. 29, authorized invitations for bids for purchase of the Gulf-Brazil-River Plate line, operating between gulf ports of the United states and ports of Brazil, Uruguay and Argentina. Bids are to be opened at noon, March 11, 1929.

Guarantee to operate the line for a period of five years will be required of the purchasers. In addition, conditions of the sale call for bids on 12 of the 13 vessels for operation over the route with guarantee of 36 round voyages a year, 12 to be monthly sailings from New Orleans and sailings from Texas ports to River plate ports.

A. C. Dalton Resigns Post

On Jan. 29, Brigadier General A. C. Dalton, vice president and general manager of the Merchant Fleet Corp., tendered his resignation to the shipping board. The resignation was to become effective Feb. 28.

Following several months' traveling and resting, after 40 years of continuous government service, it is reported that General Dalton will return to shipping circles in a civilian capacity. Although no statement was given out by General Dalton, responsible reports state that he is to become the head of a large shipping corporation which is to shortly announce a program of putting a large fleet of vessels into operation under the American flag. While neither confirming nor denying rumors, General Dalton admitted that he intended to continue his activities in the interests of a powerful American merchant marine.

Operation of Seatrain

In the second outbound voyage of the car carrier SEATRAIN, completely described in the February issue of MARINE REVIEW, the vessel carried 65 loaded freight cars. On the return voyage of the first trip the SEATRAIN carried 26 cars, of which 18 were loaded. Officials of the Overseas Railway Inc., operators of the SEATRAIN, are well satisfied with results of the new vessel.

Two more vessels were allotted by the shipping board, Feb. 11, to the coal fleet inaugurated by it last year. These two ships, when reconditioned and added to the coal fleet, will give the government eight vessels operating in the trade. Work on the vessels is to be speeded up so that they will be ready for sailing within 60 days. The addition of the two vessels came about as result of the success of the West Virginia coal companies in seeking foreign coal markets.

The annual meetings of the Institution of Naval Architects is to take place March 20, 21 and 22 in the lecture hall of the Royal Society of Arts, John street, London. The annual dinner will be held at 7:30 p. m. March 20 in the grand hall, Connaught rooms, Kingsway, W. C. London.

Western Company Buys Board Freighter

The shipping board, recently approved the sale of the vessel WEST LIANGA to the Los Angeles Steamship Co. for $100,000. Terms of the sale are 10 per cent cash and the balance over a period of 10 years. Unrestricted operation is the basis of the sale.

The ship is a steel cargo vessel of 8543 deadweight tonnage. She is equipped with General Electric geared turbines and scotch oil burning boilers, designed to steam at 10¼ knots. Since Sept. 7, the vessel has been laid up at Norfolk.

It is the plan of the Los Angeles Steamship Co. to overhaul and recondition the vessel thoroughly and place her in operation in the intercoastal trade on the Arrow line. The vessel is to replace ships taken from the service by the K. D. Dalton interests for transpacific service.

To Build Fast Ships

The shipping board, Feb. 5, authorized a loan of $6,525,000 to the Ward line for the construction of two 20-knot combination cargo and passenger vessels for operation in the Havana run. The ships are to cost $4,350,000, and the loans are on the basis of 75 per cent of the construction cost.

A statement by the shipping board announces that the ships are to be the fastest in the Havana run, not excluding the CARONIA, recently placed in the run by the British Cunard Steamship line. Statement follows:

"Loans in aid of constructing two 20-knot combination passenger cargo vessels of approximately 16,000 tons displacement for the Atlantic Gulf and West Indies Steamship lines for services on the Ward line between New York and Havana were authorized by the shipping board, Feb. 5.

"Contracts for the vessels have been let to the Newport News Shipbuilding & Drydock Co., which will deliver the vessels by Nov. 1, 1930, in time to handle the rush business of the trade during that season.

"The loans will be 75 per cent of the construction cost of the ships and interest payments will be at the minimum rates provided in the merchant marine act of 1928. Repayment will be made in annual instalments over a 20-year period, but interest will be payable semiannually.

"It is provided in the loan agreement that the vessels shall remain under American registry for a period of 20 years and so long thereafter as any sum is due the government."

Make Unusual Repair Job on Wrecked Tanker

At Palmer's Shipbuilding and Repair yard at Jarrow, where an injury received in collision with the 1800-ton tanker SAN GERARDO caused a shortening of the vessel of 10 feet, the steamer CITY OF LANCASTER is being repaired.

Beaching of the damaged vessel showed that a large area of the shell plating to the full depth of the ship, 90 feet from the stern on the starboard side, had been forced some five feet into the hold space. The plating was so crumpled that the length of the vessel was actually reduced 10 feet.

The distorted condition of the ship necessitated a special arrangement of resting blocks. The first operation after the vessel was safely installed on the blocks was to cut the hull in half, accomplished by burning through at the damage area. The task of realignment was then accomplished. Two of the sections of the ship were then drawn apart to give her the original length, 335 feet.

The unusual feature of the damage was that not one of the plates was fractured, nor a rivet sheared. The transverse launching in the dock was a very delicate operation requiring the laying of a series of ways at different angles. Completion of these permitted removing the blocks and shores supporting the vessel, allowing the weight to gradually come to rest on the ways. Hydraulic jacks, each of 200 tons lifting capacity were then put into operation, carrying the vessel into the position required.

S. S. Oakhurst Sold

Sale of the S. S. OAKHURST, a steel cargo vessel of 9400 deadweight tons, to the Leathem Smith-Nacco Steamship Line Inc. for the sum of $35,000 cash, with the understanding that alterations and betterments costing not less than $450,000 would be performed on the ship, was approved by the shipping board Jan. 29. The vessel is to be converted into a self-discharging collier, with engines located aft. The ship is to be operated between Norfolk and West Indies ports, or Norfolk and Canadian ports, and coastwise.

Idle Tonnage Decreases in World Shipping

Laid-up shipping in the maritime countries of the world was less at the beginning of this year than any time during the period of post-war depression. Reports state that there were only 3947 idle ships, a decrease of 352,000 gross tons, or 8 per cent, from that at the beginning of 1928 and a decrease of 1,664,000 tons, or 30 per cent, from that on the first of the year 1925. As the greater part of the laid-up tonnage has been in the United States, Great Britain and Ireland, it is to be noted that the reduction has of necessity taken place in those countries. This is attributed to expanding overseas trade.

Sidney Lund Wood, vice president of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., died at his home in Newport News, Feb. 16, after an illness of two weeks with the grippe. Mr. Wood was 58 years of age. He had been active in the management of the business end of the shipyard for years.

What the British Are Doing

BRITISH shipbuilding has made a fair start. A substantial tonage of new orders was placed in January and this, added to the work in hand before the new year should provide a good deal of employment during the next few months. The launching output while not very large was well up to the average for the month. It consisted of five vessels aggregating 33,124 gross tons. During the month 19 contracts were placed including orders for two torpedo boat destroyers to be built for the admiralty by John Brown & Co., Clydebank, and two passenger steamers for the Canadian Pacific railway to be built by the Fairfield Shipbuilding and Engineering Co. Ltd.

WILLIAM GRAY & CO. LTD. of West Hartlepool recently launched their thousandth vessel. A feature of the occasion was that it had to take the water in the darkness owing to the late tide. The ship is an Ellermann liner, the CITY OF DIEPPE weighing 11,200 tons. To commemorate the event the firm entertained their employes when speeches were made by members of the firm. A. J. S. Todd, a nephew of Sir John Ellermann, said that since the end of the war more than 120 ships had been built by Grays, a record unequalled by any other shipbuilder or shipowner. Sir William Gray referred to the fact that they had a full program for their shipyards and engine works which, though leaving little if any margin for profit, ensured steady employment for some time to come.

COMMODORE W. Hose and Engineer Commander T. E. Phillips, representatives of the Royal Canadian navy from Ottawa, recently arrived in Liverpool with contracts for the construction of two destroyers for Canada. These are to be of the latest Admiralty pattern, 310 feet long 19 feet wide, with a speed of 35 knots and a tonnage of 1320. The contracts for building these vessels have been secured by John I. Thornycroft & Co. Ltd.

THE steamer MEADCLIFFE HALL was recently launched from Smiths dockyard on the south bank of the Tees, built to the order of the Hall Corp. of Montreal. Smiths Dock Co. have at present 29 vessels on the books including six grain steamers for the Great Lakes. The present position on Teesside is said to be full of promise for the next few months The Furness Shipbuilding Co. of Haverton Hill have booked an order from British owners for three 10,000-ton vessels. The report of the directors of Smiths Dock Co. for the twelve months ended September last shows profit of £85,224, giving dividends of 5 per cent on the preference and 6 per cent on the ordinary shares.

THE new British 10,000-ton cruiser SUSSEX built and engined by Hawthorn Leslie & Co. Ltd. has completed the whole series of her official trials and is now back at Hebburn on Tyne ready for formal delivery to the admiralty. The vessel is of 10,000 tons standard displacemnt and 80,000 shaft horsepower. Her length is 595 feet, breadth 66 feet and mean draft at the standard displacement 17 feet. The designed speed is 32¼ knots

and her oil fuel capacity 3200 tons. The ship was laid down in February 1927 and due to be completed in the financial year which begins in April.

THE motor vessel AUSTRALIND which has been built for the Australind Shipping Co. Ltd. of London by William Denny & Bros. Ltd., was launched Feb. 8 from the Leven shipyard, Dumbarton. The AUSTRALIND is a single screw motor cargo vessel of the open shelter deck type with three cargo holds forward and two aft, No. 3 hold immediately forward of the machinery space being also arranged to serve as a deep tank. The vessel is 425 feet long and 8800 tons deadweight. The main propelling machinery consists of one Denny-Sulzer, two-cycle diesel engine of the marine type having six cylinders, one double acting scavenge pump, three stage air compressor and pumps.

ACCORDING to Mr. Bridgeman, first lord of the admiralty, six British warships are provided for in the estimates of February and March this year. They are allocated as follows:—one cruiser at the Portsmouth dockyard, one cruiser and two sloops at Devenport, one submarine and one submarine depot ship at Chatham. The remaining ships will be built by contract in private shipyards accustomed to naval work.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Jan. 18, 1928 on Future Loadings

NOTE: FREIGHT RATES STEADY WITH SLIGHT CHANGE

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 180 lbs.	††Finished steel	REMARKS Freight Offered
Liverpool	3s 6d	$0.65	$0.45	0.20	$0.50	$0.90	$8.00T***	Fair
London	2s 6d	0.65	0.45	0.20	0.50	0.90	8.00T***	Fair
Oslo	$0.14	0.45	0.50	0.30	0.42½	0.85	8.00T	Fair
Copenhagen	0.14	0.45	0.50	0.30	0.45	0.90	8.00T	Fair
Hamburg	0.10	0.35	0.45	0.20	0.50	0.90	10.00T	Fair
Bremen	0.10	0.45	0.45	0.20	0.50	0.90	10.00T	Fair
Rotterdam and Amsterdam	0.14	0.42½	0.45	0.22	0.45	0.80	9.50T	Fair
Antwerp	0.14	0.42½	0.45	0.22	0.45	0.80	9.50T	Fair
Havre	0.15	0.55	0.31	0.30	0.45	0.80	9.00T	Very good
Bordeaux	0.15	0.55	0.31	0.30	0.45	0.80	9.00T	Very good
Barcelona	....	0.50	0.30	10.00 bags	—12.00T—		10.00T	Fair
Lisbon	....	0.65	0.45	8.00T bags	—23.00T—		8.00T	Fair
Marseilles	....	0.65	0.40	7.00 bags	—23.00T—		8.00T	Fair
Genoa	0.15	14.25T	0.50	9.00	—23.00T—		11.50T	Fair
Naples	0.15	14.25T	0.50	9.00	—23.00T—		11.50T	Fair
Constantinople	0.27	20.00T	0.75	0.40½	—24.00T—		11.50T	Fair
Alexandria	....	20.00T	0.75	0.40½	—24.00T—		11.50T	Fair
Algiers	....	0.75	0.60	8.0T bags	—23.00T—		11.50T	Fair
***Dakar	....	20.40	....	18.60T	—27.60T—		13.80T	Fair
Capetown	....	18.00	....	13.00 per 2240 lbs.	20.00		20.00	Good
Buenos Aires	....	22.00T	....	....	20.00 to 22.00T†		8.00 to 8.80T	Fair
**Rio de Janeiro	....	22.00T	....	....	20.00 to 22.00T†		7.00 to 7.70T†	Fair
Pernambuco	....	22.00T	....	9.00T	—22.00T—†		9.70T†	Fair
Havana	0.30*	0.50	....	0.30*	0.61	1.33	10.00	Fair
Vera Cruz	0.35	0.40	0.50	0.35	x		0.25 to 0.35	Fair
Valparaiso	....	1.07	....	0.70	....	....	10.00T	Fair
San Francisco	....	0.45 to 0.90	....	0.40 to 1.10	....	....	0.25 to 0.30	Very good
*Sydney	....	22.50T	1.25	22.50T	17.50 to 27.50T		9.00 and 12.00	Fair
Calcutta	....	....	0.70	12.00T	—18.00T—		10.00T	Fair

From North Pacific Ports to	Lumber Per m. t.
San Francisco	$4.25 to 4 50
South California	4.50 to 5.00
Hawaiian Islands	9.00 to 10.00
New Zealand	15.00 to 18.00
Sydney	11.00 to 13.50
Melbourne-Adelaide	12.50 to 14.00
Peru-Chile	11.75 to 14.00
South Africa	17.00 to 20.00
Cuba	14.00 to 15.00
United Kingdom	62s to 65s
Baltimore-Boston range	$12.00 to 14.00
Florida Range	17.00
Buenos Aires	14.00
South America — East Coast	14.00 to 20.00
South America — West Coast	12.00 to 14.00
China	10.00 to 11.00
Japan	10.00 to 10.50
Japan (logs)	12.00 to 14.00

Flour and Wheat

U. K. and Continent (gross tons)	34s to 35s
Oriental Ports (net tons)	$5.00 to 5.50

T—Ton. ‡Per quarter of 480 lbs. †Landed. ††Heavy products limited in length. *Extra charge for wharfage. **Plus $0.50 surcharge on all rates to Rio de Janeiro on account of congestion. ***Plus 15 per cent. xNo general cargo rates to Vera Cruz.

*Flour to Sydney—$22.50. General cargo—$17.50 to $27.50 Finished steel—$9.50 and 12.50.

***Rates, effective at once, to DAKAR, will be based on whether the company makes a contract. Rates without a contract will be about 20 percent higher. With a contract the same rates as last month apply. The figures are the rates which the company will have to pay which does not make a contract with the Daniel Bacon line to use it exclusively.

NOTE: Lighterage rates on fuel in New York reduced from 6½ to 5½c per barrel. The coal strike in Britain is now settled and freight rates or bunker prices for coal or pig iron are again quoted.

General cargo rates to Havana change daily and are omitted for the time being.

Rates to Calcutta are subject to change without notice. Cotton goes only to Bombay. Landing charge of $2.00 per freight ton at Valparaiso.

Principal Rates To and From United Kingdom

	s	d
Grain, River Plate to United Kingdom	24	9
Coal, South Wales to Near East	12	0
Coal, United Kingdom to Buenos Aires	13	3
Manganese Ore, Poti to Philadelphia	$3.85	

	s	d
Pig iron, United Kingdom to New York or Philadelphia	13	0
Iron ore, Bilbao to Cardiff	6	3
Iron ore, Huelva to Phila. or Balto	11	9

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
April 19, 1928	5.00@5.60	1.40	4.92
May 19	5.00@5.60	1.30	4.92
June 19	5.00@5.60	....	4.92
July 18	5.00@5.60	1.10	4.92
Aug. 18	5.00@5.60	1.10	4.92
Sept. 18	5.65	1.10	4.92
Oct. 18	5.65	1.10	4.92
Nov. 20	5.00@5.65	1.10	4.92
Dec 18	5.00@5.65	1.10	4.92
Jan. 18	5.00@5.65	1.10	4.92
Feb. 18, 1929	5.00@5.65	1.10	4.92

At Philadelphia

	Coal trim. in bunk per ton	Fuel oil alongside per barrel	Diesel Eng. oil alongside per gallon
April 19, 1928	5.00@5.60	1.21@1.25	4.64@4.87
May 18	5.00@5.60	1.20@1.25	4.87
June 19	5.00@5.60	....	....
July 18	5.00@5.60	1.10	4.88
Aug. 18	5.00@5.60	1.10	4.88
Sept. 18	5.65	1.00	4.88
Oct. 18	5.65	.95@1.00	4.88
Nov. 20	5.65	.95	4.88
Dec. 18	5.00@5.65	1.05	4.88
Jan. 18	5.00@5.65	1.05	4.88
Feb. 18, 1929	5.00@5.65	1.05	4.76

Other Ports

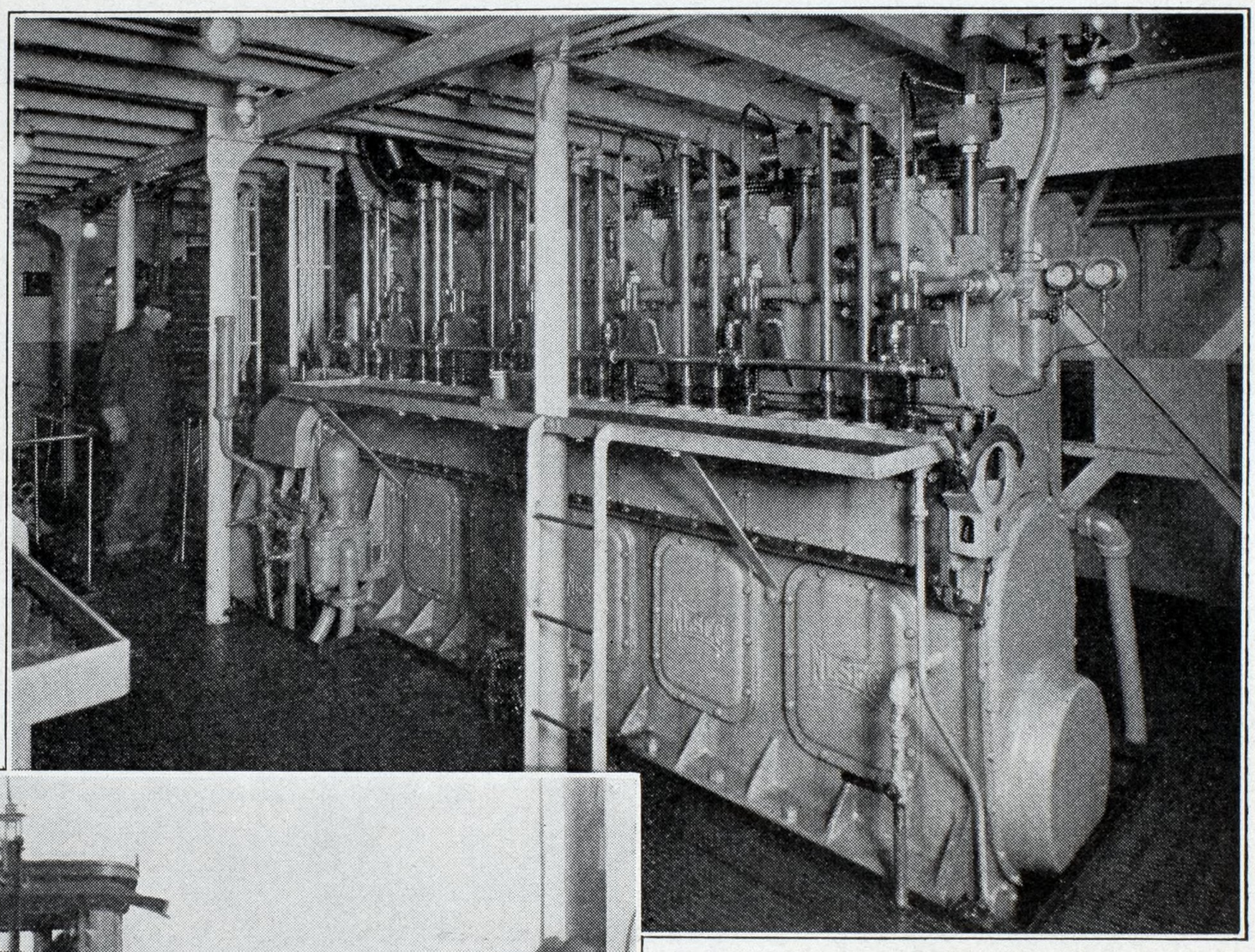
Boston, coal, per ton	$7.37
Boston, oil, f. a. s., per barrel	1.09
Hampton Roads, coal, per ton, f.o.b., piers	$4.40 to 4.50
Oct. 7 — Cardiff, coal, per ton	13s 9d
London, coal, per ton	—s —d
Antwerp, coal, per ton	18s 0d
Antwerp, Fuel oil, per ton	80s0d
Antwerp, Diesel oil, per ton	87s 6d
British ports, Fuel oil	67s 6d
British ports, Diesel oil	82s 6d

Costs are Cut in Half

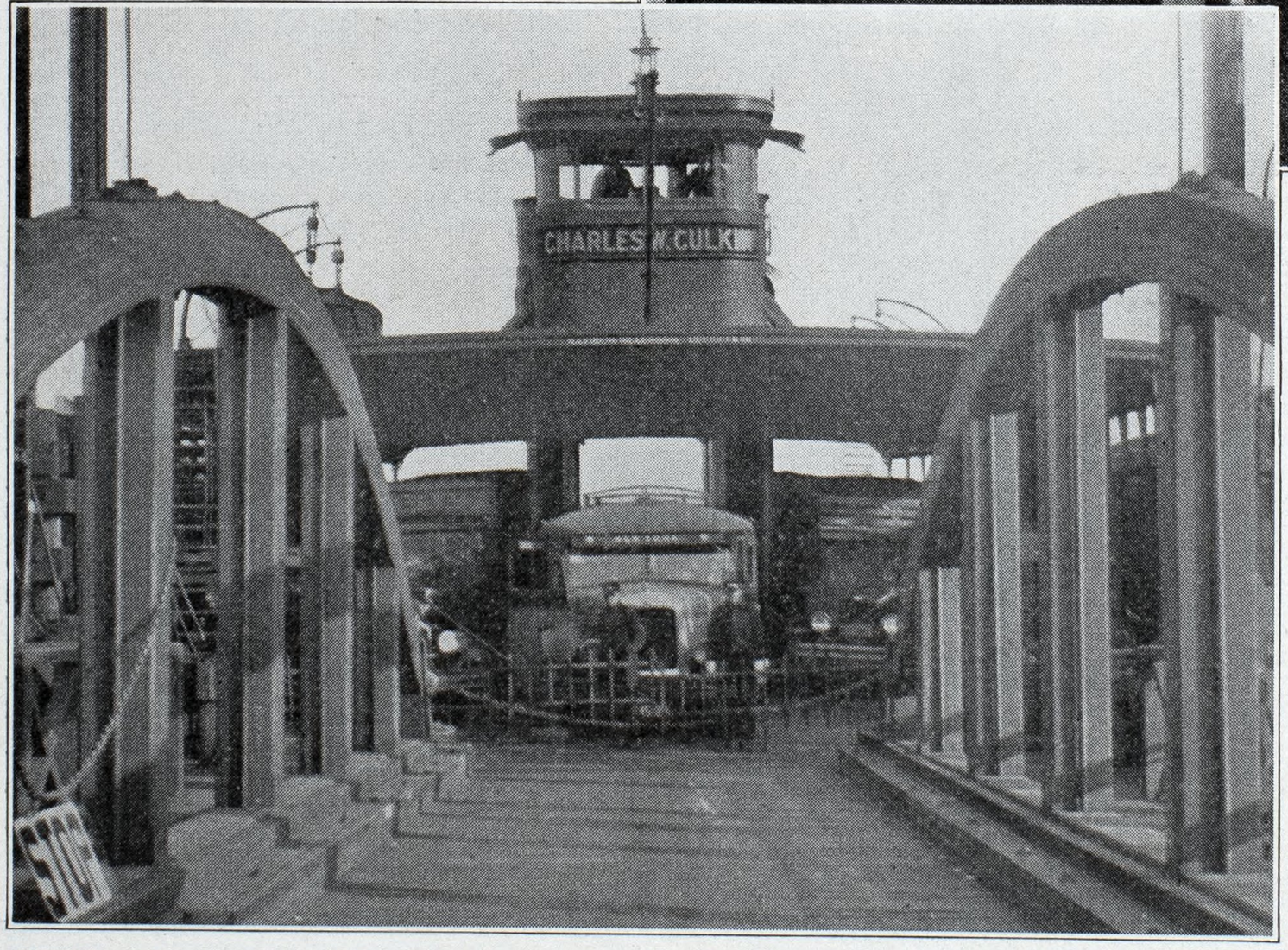
(*Continued from Page* 31)

boat the expenses per day including the man on board will be $25. All or practically all of this can be saved where diesel power is used.

In the case of the steam boat it is necessary to recurrently obtain fresh water for the boilers. It is also necessary to go to considerable trouble and expense to have ashes removed. Every so often a layup must be made for cleaning boilers. Again in actual service judging by the experience with the electric ferries as compared with steam ferries, running in adjacent services, the damage done to slips in the case of the steam boat is sometimes very serious whereas no damage has been caused by the electric ferries. Steam power is not as good as electric power in this case because it is not so definite. The captain on the bridge of the electric ferry has complete control of full power ahead or astern by merely moving a controller. He does not have to depend on the correctness of transmission, nor wait on the delay possible in using engine room signals. The captain's action in the pilot house is instantaneously reflected in the engine room of the electric ferry and consequently he knows that he can have his full power in either direction whenever he wants it at a moment's notice.



ENGINE ROOM OF THE DIESEL ELECTRIC FERRIES, GOVERNOR MOORE AND CLASS—SHOWING ONE OF THE TWO 350-H.P. NELSECO DIESEL ENGINE GENERATING SETS



DIESEL ELECTRIC FERRY CHARLES W. CULKIN IN SLIP AT WEEHAWKEN, N. J. CAPACITY 50 AUTOMOBILES OR 40 MIXED TRUCKS, BUSSES AND AUTOMOBILES

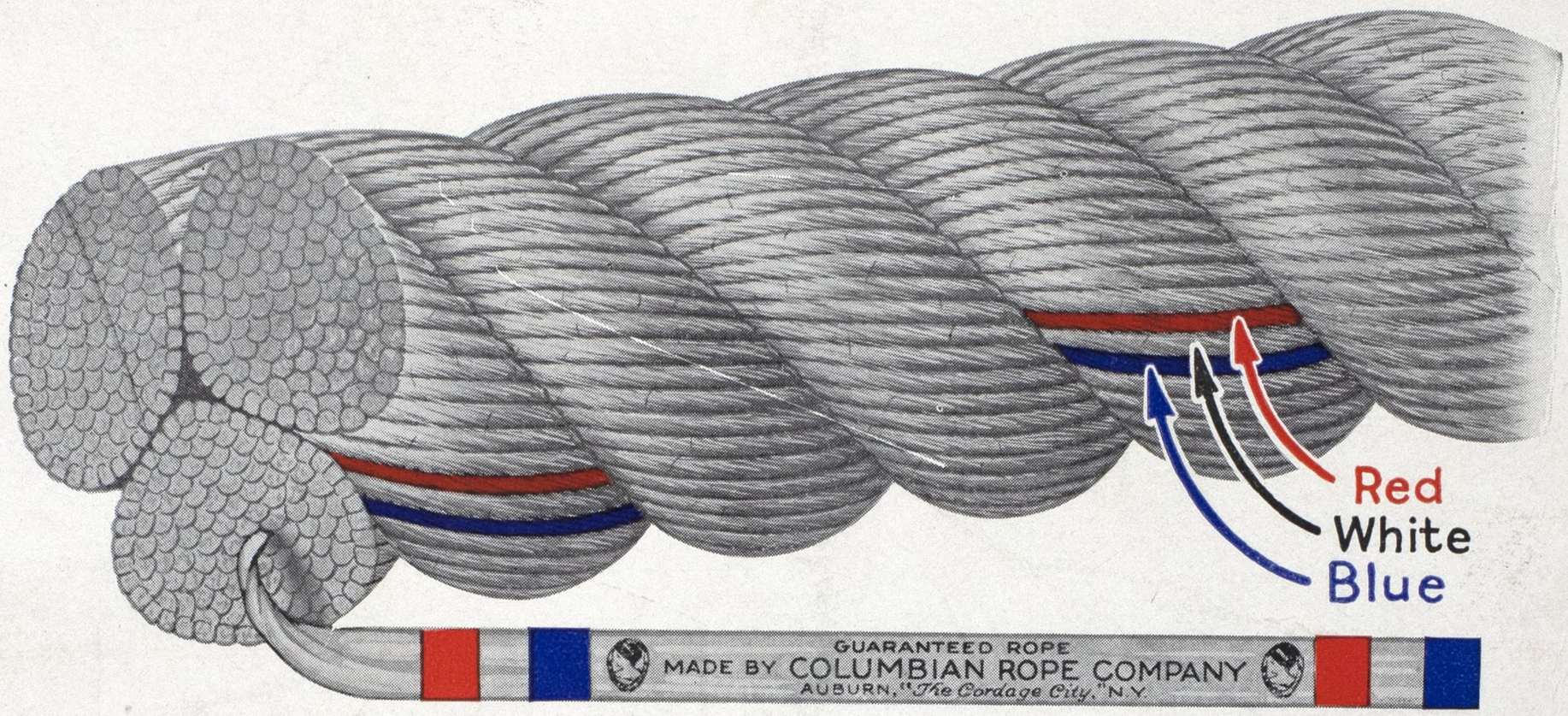
The diesel electric ferry has constancy of power which serves to avoid damage to slips. This is a definite advantage in a comparison with steam boats. In cold weather the captain of a steam ferryboat cannot depend on full power from his boilers after a run. Also the power that the captain can be certain of at any given time is entirely dependent on the condition of his boilers as well as the weather. In a diesel boat and particularly with electric drive the captain has instantaneous control of his power and this power is constant at all times.

Another important feature in making a comparison with a coal burning steam ferry would be the very serious increased maintenance cost. The average cost for a steam boat about this size has been found in actual service to be about $4000 annually. A practical operator for many years accustomed to steam operation and thoroughly familiar with all of the advantages and disadvantages of this type of drive, after some months experience with diesel drive ferries is completely enthusiastic over the many advantages of the latter. No boilers or steam lines to worry about and to be constantly picked away at in the way of repairs, no ashes or water to bother about and complete preservation of the hull in all parts, while in the steam boat there is serious deterioration in bunker spaces and elsewhere where coal comes into contact with the vessel's structure.

Three diesel electric ferries are now giving with one slip at each end, fully as good service as that which could be rendered by five steam boats requiring two slips at each end. The two extra slips and two extra steam boats would mean an additional extra investment of at least $750,000. The turn around of the diesel electric ferry is much quicker than that possible in the case of the steam ferry. The former will remain in the slip four minutes per trip while the latter needs at least ten minutes in the slip.

Since the vehicular tunnel has been in operation practically all the ferry services across the North river below Forty-second street have been running behind their former schedule. The one exception to this rule is the Electric Ferries Inc. which is now running with fifty per cent more traffic than before the tunnel opened. Its schedule has been added to by thirty per cent partly to make up for the decrease in service on other ferry routes in this locality.

Marine Review
Reg U.S. Pat. Off.
The National Publication Covering the Business of Transportation by Water
March, 1929



Further Proof of Confidence

For years, all Columbian *Tape-Marked* Pure Manila Rope has contained the well known red, white and blue *Tape-Marker*, easily found in one of the strands. This *Tape-Marker* has borne, and still bears the manufacturer's signed Guarantee. Such protection for the user is unequaled in any other line on the market.

Now in all Columbian *Tape-Marked* Rope that is ¾ inches in diameter, or larger, there will be found the new

Red, White and Blue Surface Markers

It is possible to tell a Columbian line at a glance and these surface markers give still further proof of the manufacturer's confidence in a line that has proven itself worthy of such confidence.

When all lines aboard contain the *Tape-Marker* and the new surface markers, you are using Guaranteed Columbian Lines, recognized as a strictly quality product and unsurpassed by any other make in the world.

Columbian Rope Company

332-90 Genesee Street

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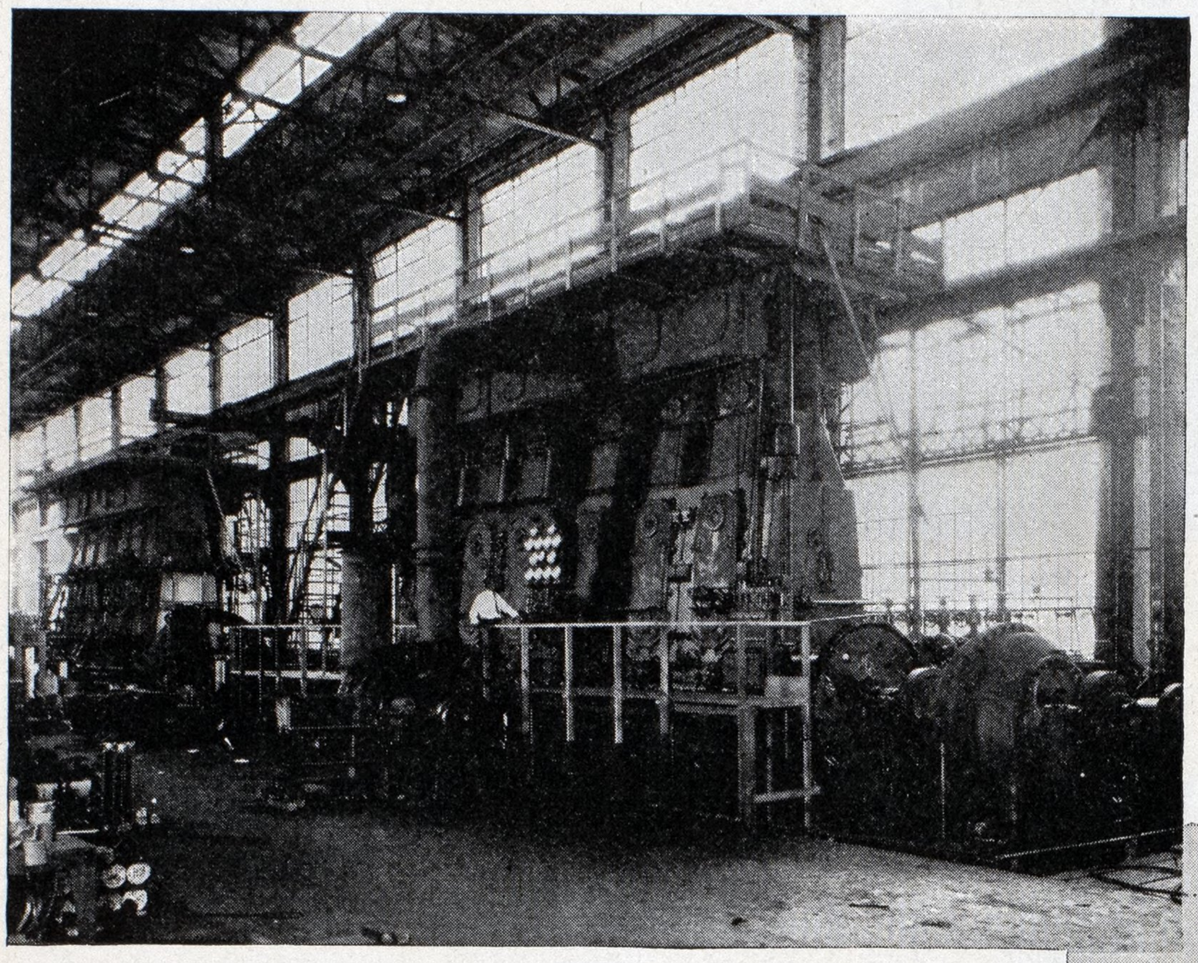
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Vol. 59, No. 3, March, 1929, issue of MARINE REVIEW, published monthly at Cleveland, Ohio. Entered as second class matter at the post office, Cleveland, Ohio, under the act of March 3, 1879. Subscription price $3.00 a year in U. S.; Canada, $4.00; Great Britain, £1; single copies, 35c.

MOTORSHIPS



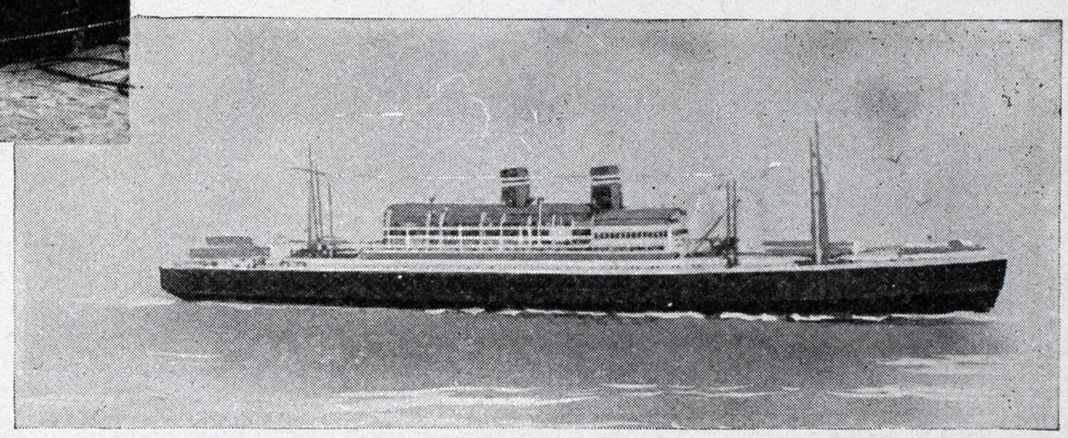
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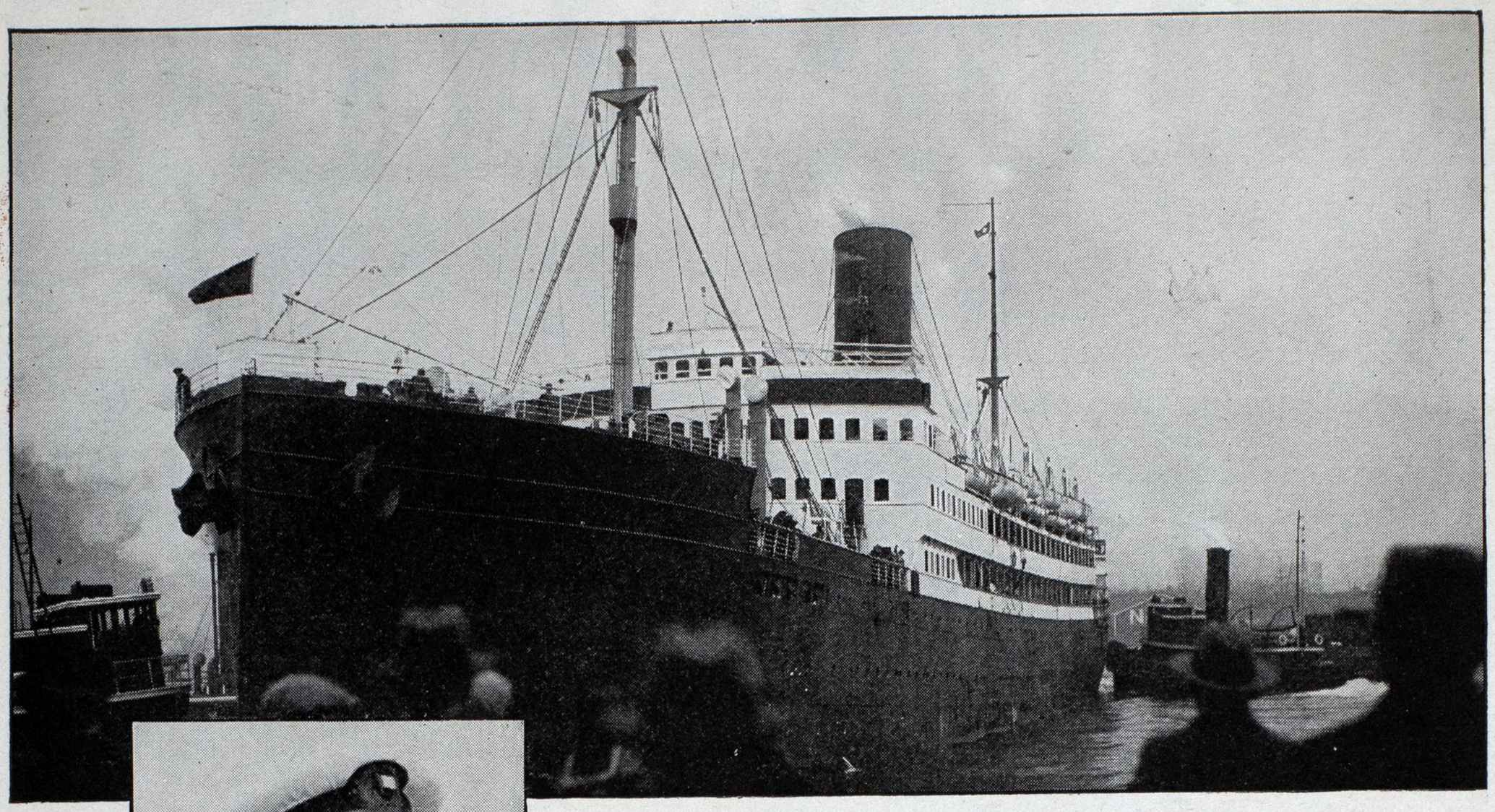
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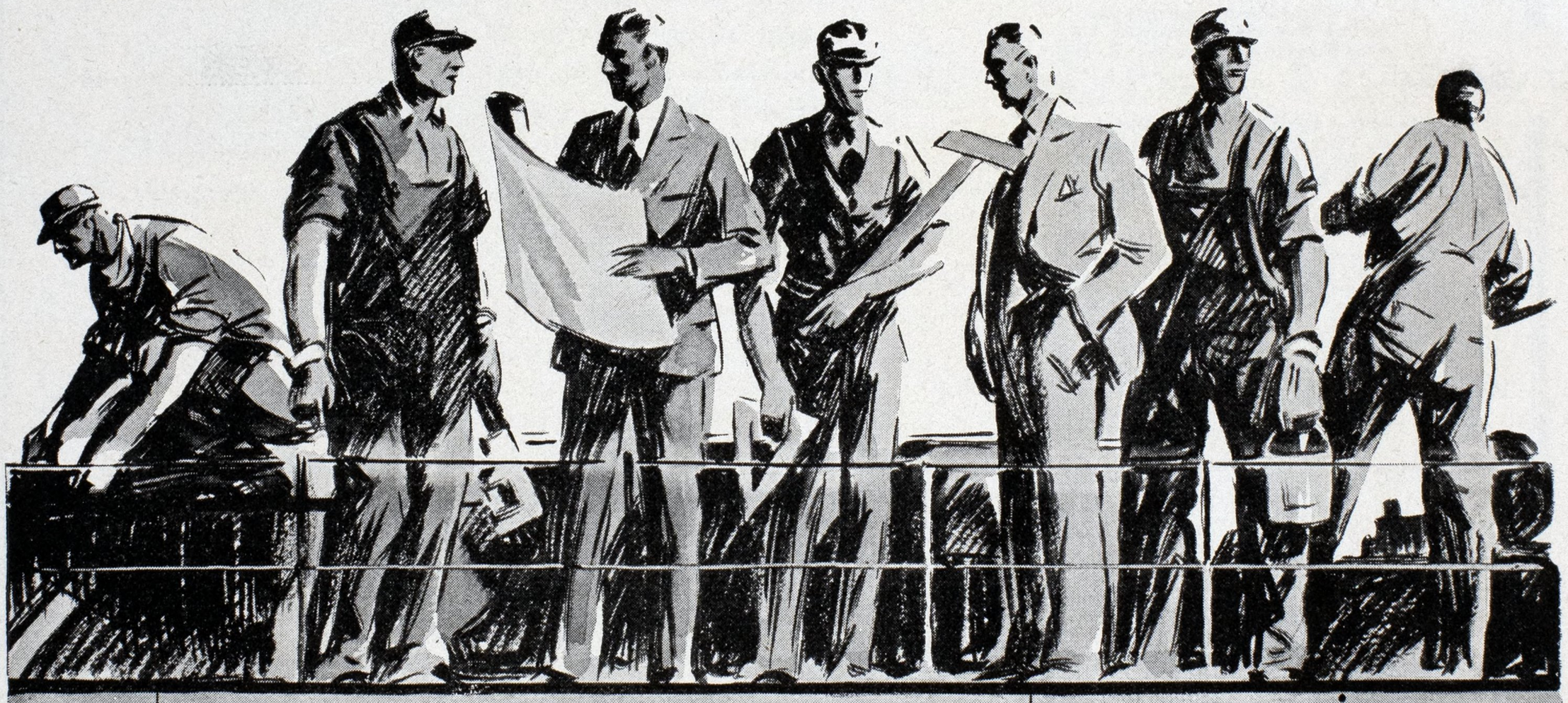
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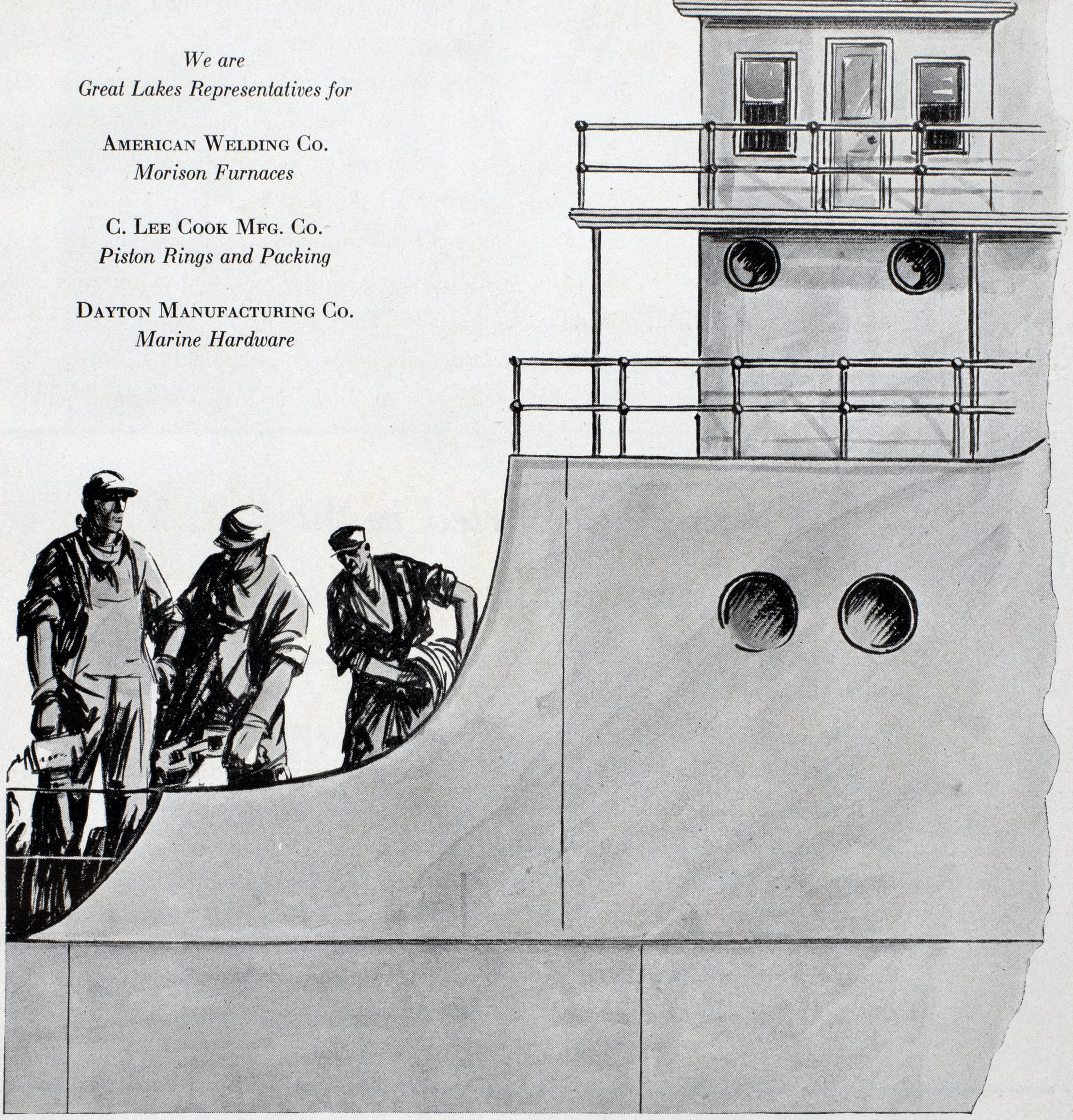
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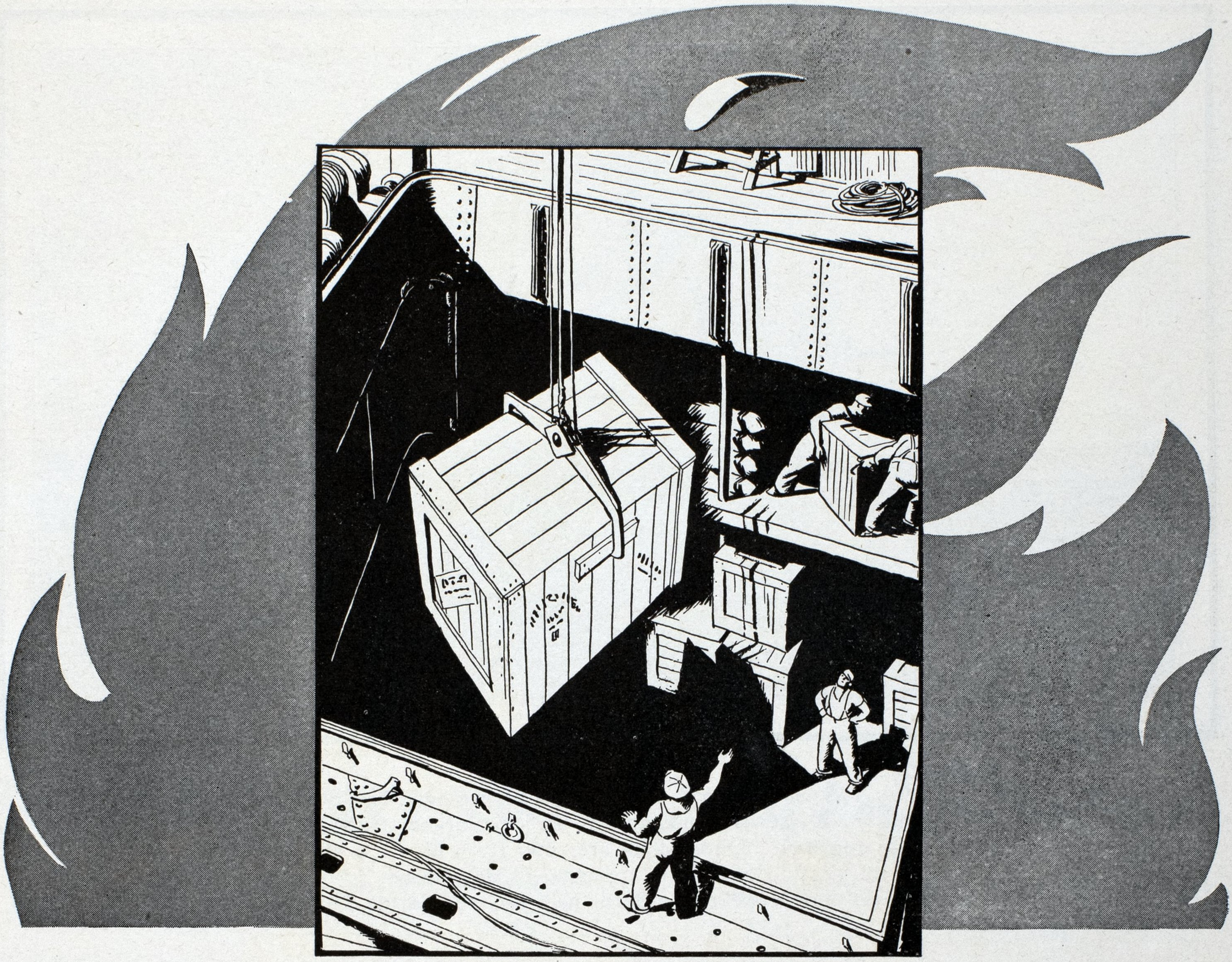
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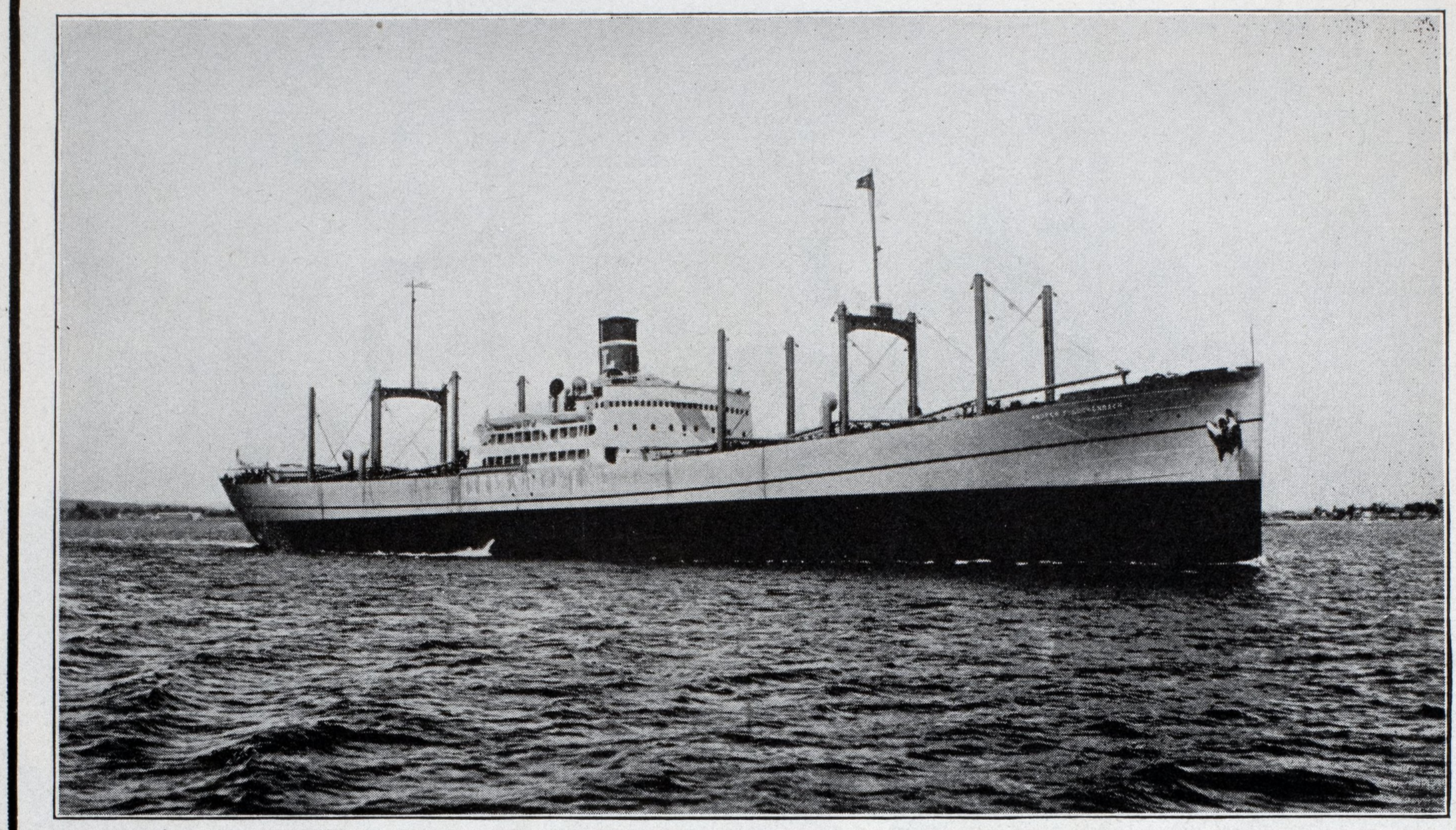
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The S. S. Andrea F. Luckenbach, shown here, and its sister ship, the S. S. Lewis Luckenbach, are the largest freighters of American registry. Dimensions are: 496 ft. x 68 ft. x 40 ft. x 28 ft. 8 in. draft; Deadweight tonnage, 14,300; Speed, 13 Knots. These vessels are propelled by Bethlehem Geared Marine Turbines.

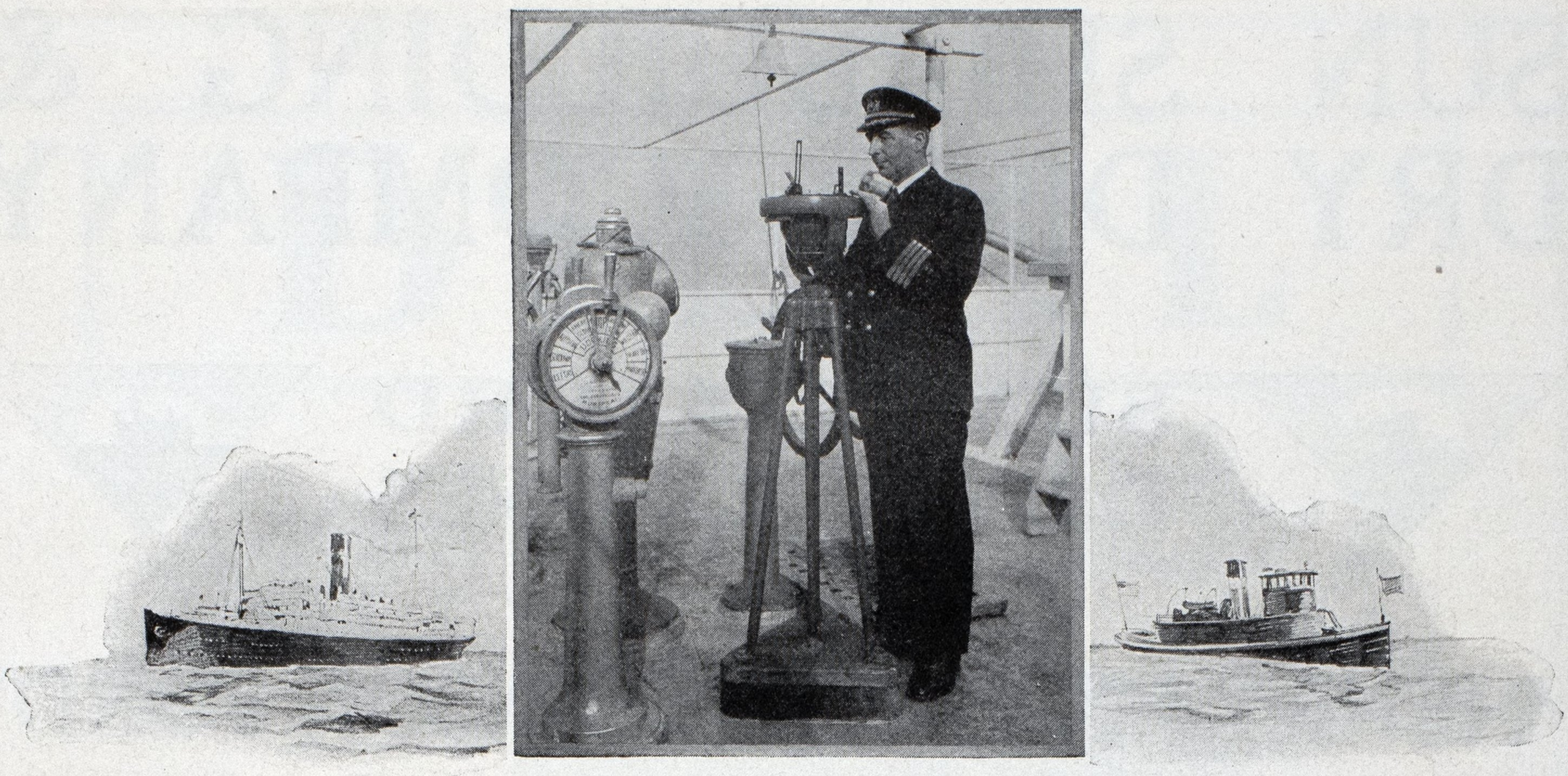
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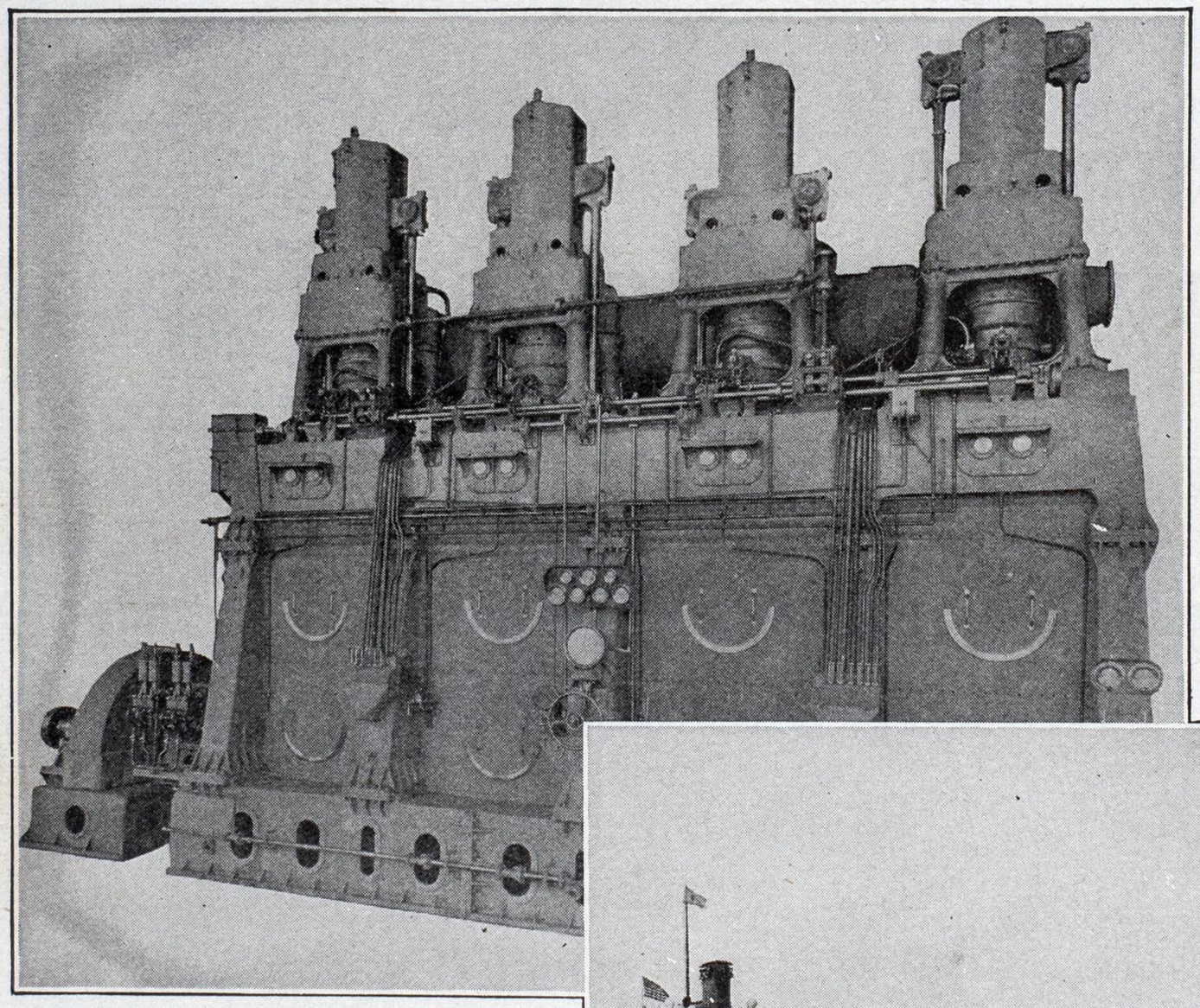


SUN-DOXFORD DIESEL ENGINES

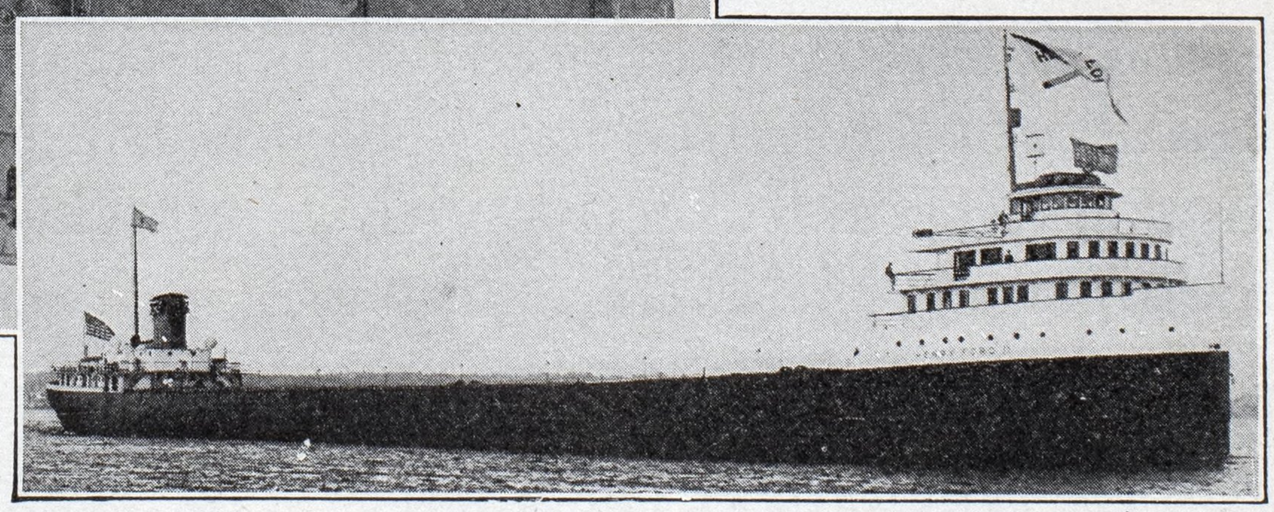


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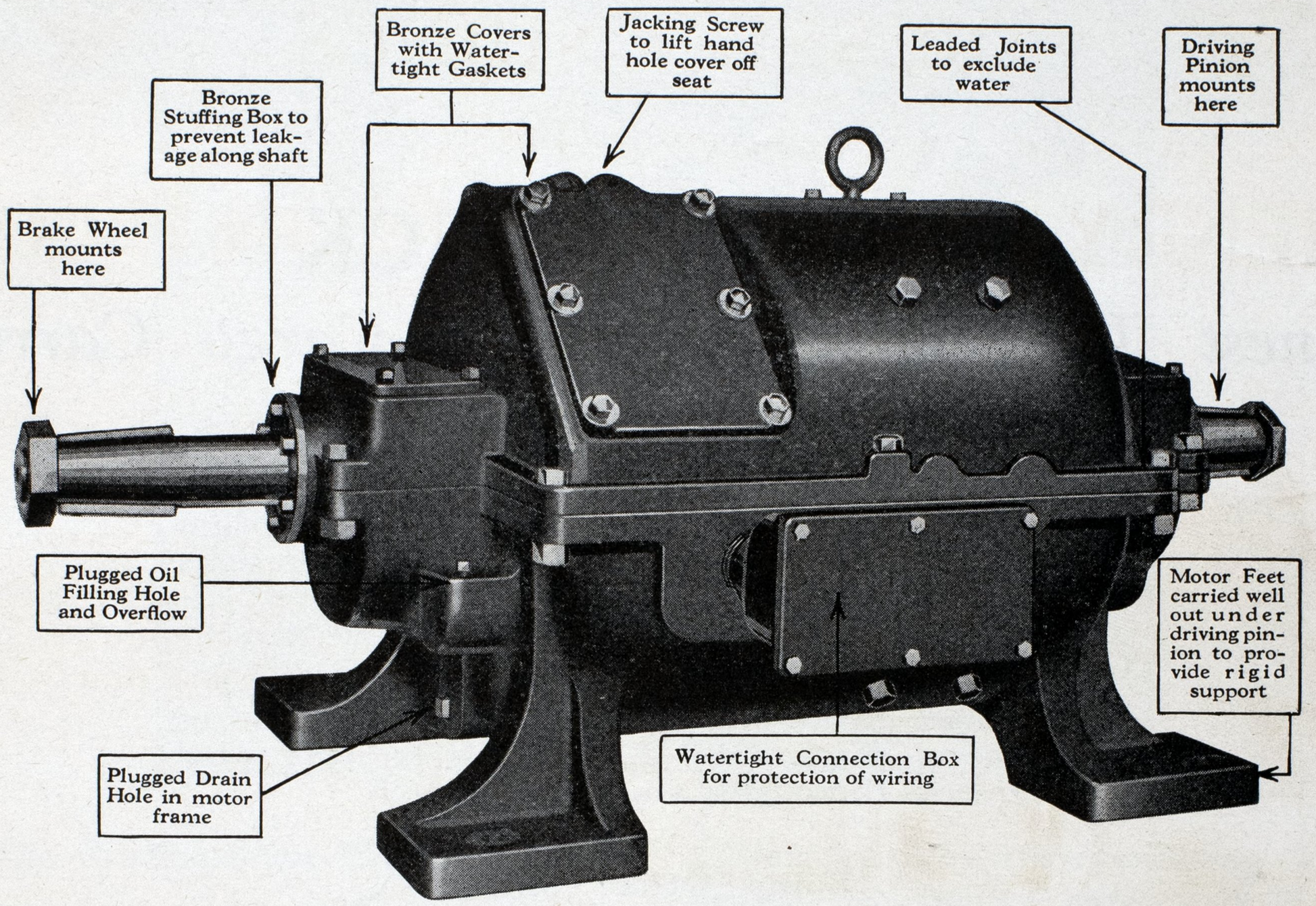
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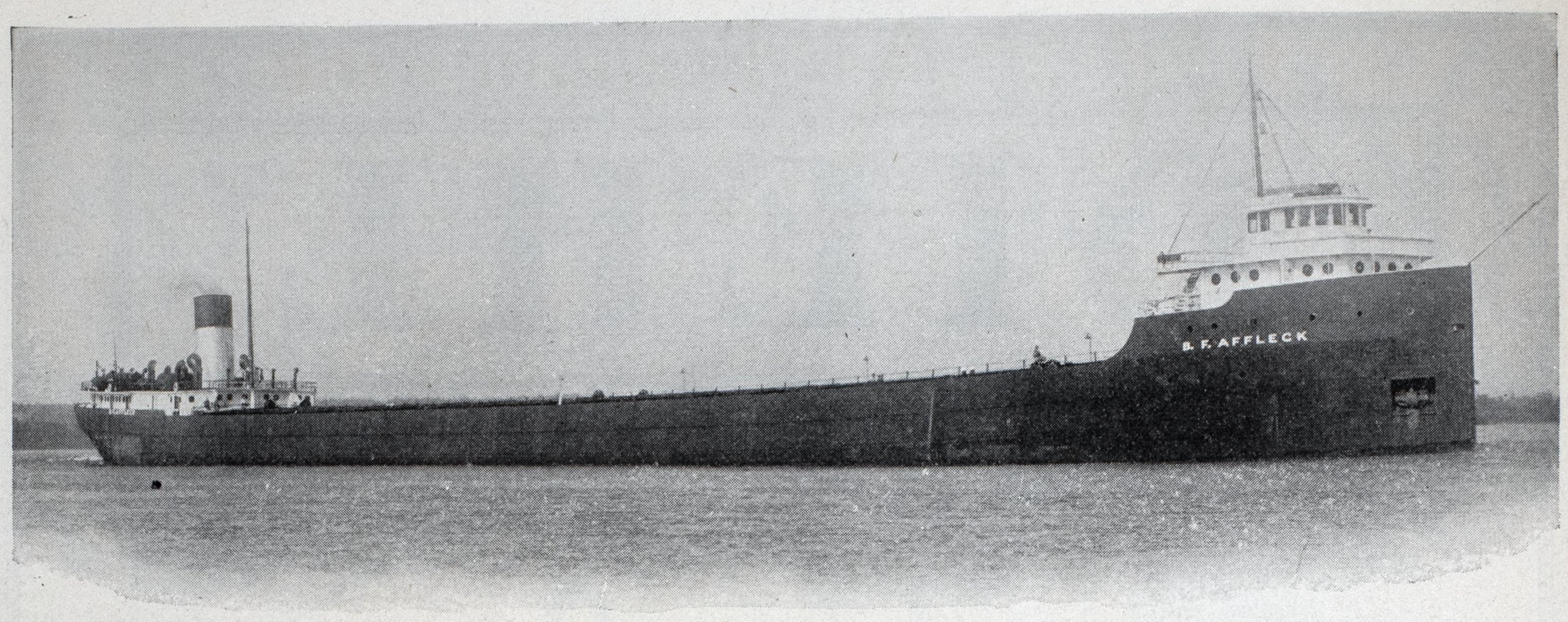
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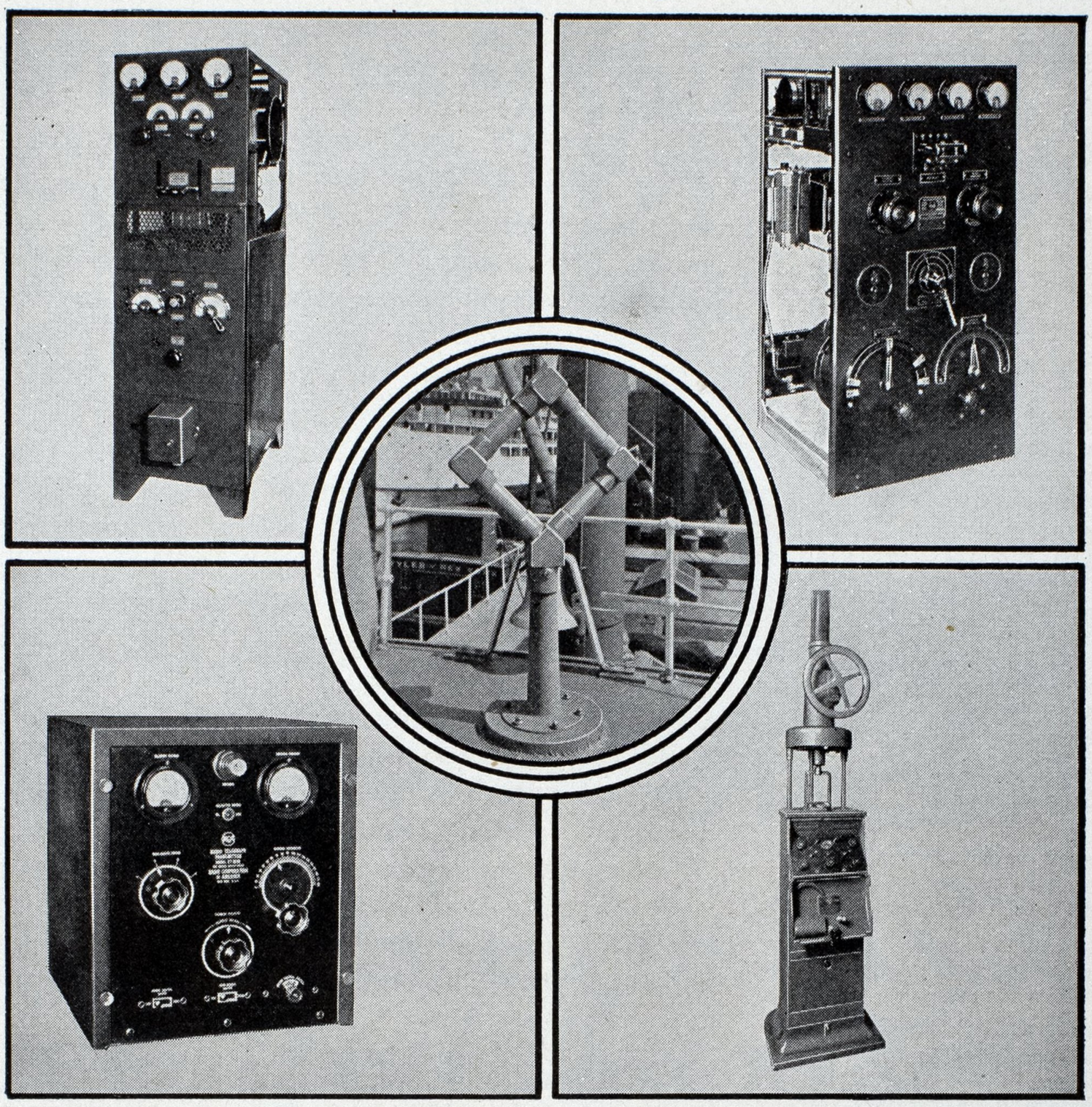
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Hibernia Bank Bldg., New Orleans, La.
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GULF WEST MEDITERRANEAN LINE
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Texas ports to Mediterranean ports

TEXAS UKAY LINE
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Texas ports to United Kingdom ports

TEXAS STAR LINE
New Orleans, La.
Texas ports to French and Belgian ports

UNITED STATES LINES
45 Broadway, New York City
Passenger, mail, freight services to England, Ireland, France and Germany

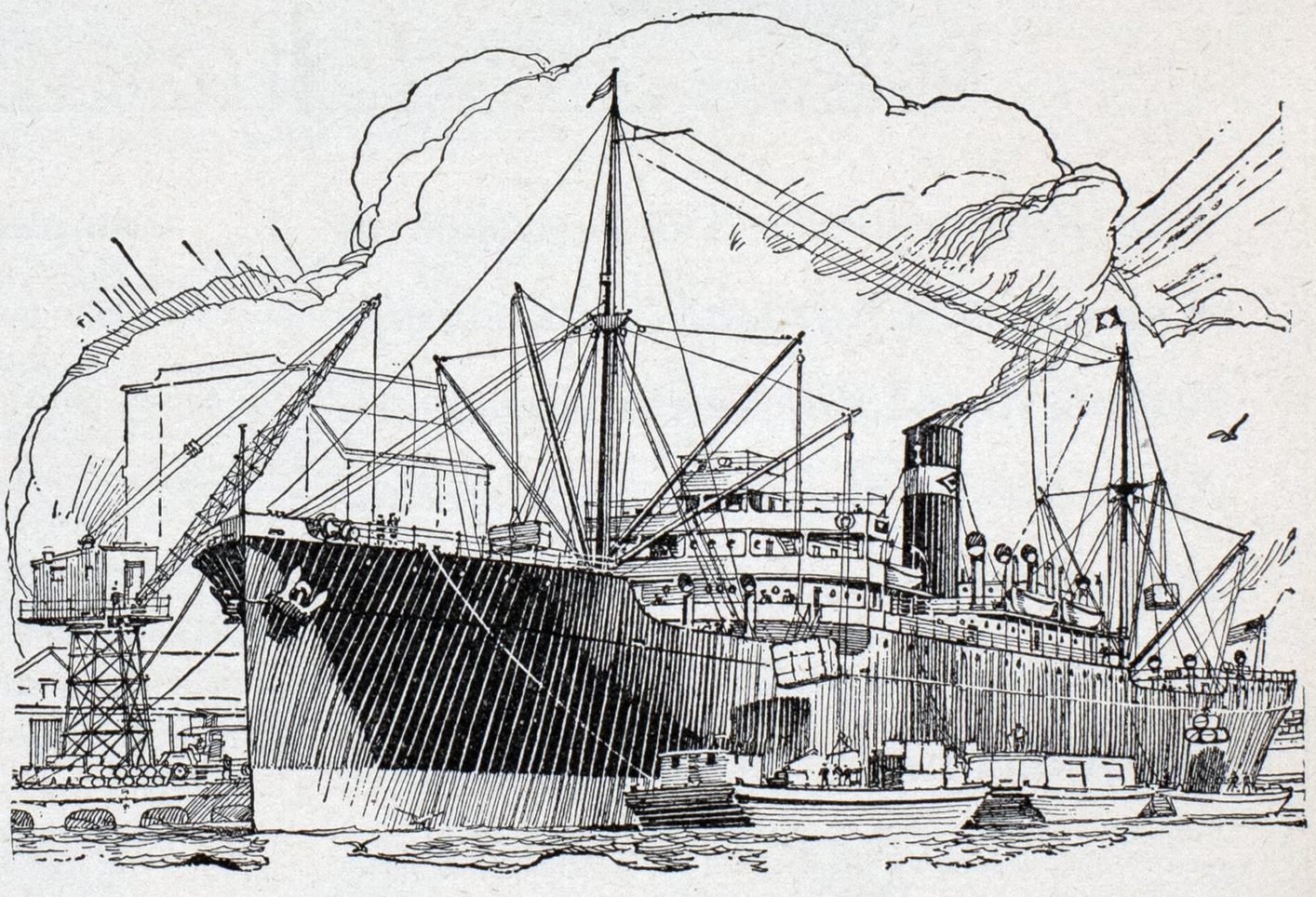
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On this page are listed the 20 lines, embracing 256 vessels, under Shipping Board management. Available to users or prospective users of all these lines are the advice and counsel of the experienced American operators of the Merchant Fleet Corporation. These experts will be glad to help you solve any shipping problems.

For complete information on either freight or passenger services, write for "Trade Routes and Shipping Services," a comprehensive free booklet issued for manufacturers interested in Foreign Commerce.



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PASSENGER SERVICES: Luxurious passenger accommodations are available on the vessels of the United States Lines which include the famous Leviathan, world's largest ship. The American Merchant Lines, with sailings weekly, offer comfortable passage at remarkably reasonable rates between New York and London.



TRIUMPH and DEFIANCE
with Diesel Electric Drive

HELPFUL legislation and the growing realization that the best protection for our foreign markets is an adequate and efficient merchant fleet, are responsible for the present activity in American shipbuilding. The increasing construction of new and modernized vessels is insuring national prosperity.

The 10,000-ton freighters Triumph and Defiance, two outstanding additions to our merchant marine, are equipped with modern Diesel electric drive. This type of propulsion was chosen because of its reliability, economy and flexibility. Westinghouse, with wide experience in the design and manufacture of Diesel electric apparatus, supplied the complete electrical equipment of both vessels.

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Motor Ship Caliche, 7000 d. w. t., equipped with 1800 H. P. McIntosh-Seymour Diesel Engine. Lubricated with Texaco Ursa Oil.



TEXACO URSA OIL

Lubricates the Diesel Engine of the

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When the converted Motor Ship Caliche went into commission in the Spring of 1927, Texaco Ursa Oil was selected to lubricate the 1800 H. P. Diesel Engine.

Today Texaco Ursa Oil is still the exclusive Diesel lubricant. Texaco Ursa Oil is refined especially to meet the exacting requirements of Diesel Engine lubrication. This installation is 100% Texaco. The Caliche power plant is lubricated as follows:

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Bearings. . . . . Texaco Ursa Oil
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Air Compressors . . Texaco Ursa Oil

The Caliche is owned by the Anglo-Chilean Consolidated Nitrate Corporation and operates between San Pedro, California and Tocopilla, Chile.

Texaco Ursa Oil has all the qualities of a perfect Diesel lubricant and its low carbon residue is absolutely exceptional. The clear golden color is the visible indication of supreme purity.

TEXACO LUBRICANTS

THE TEXAS COMPANY

Marine Sales Division

17 BATTERY PLACE, NEW YORK CITY

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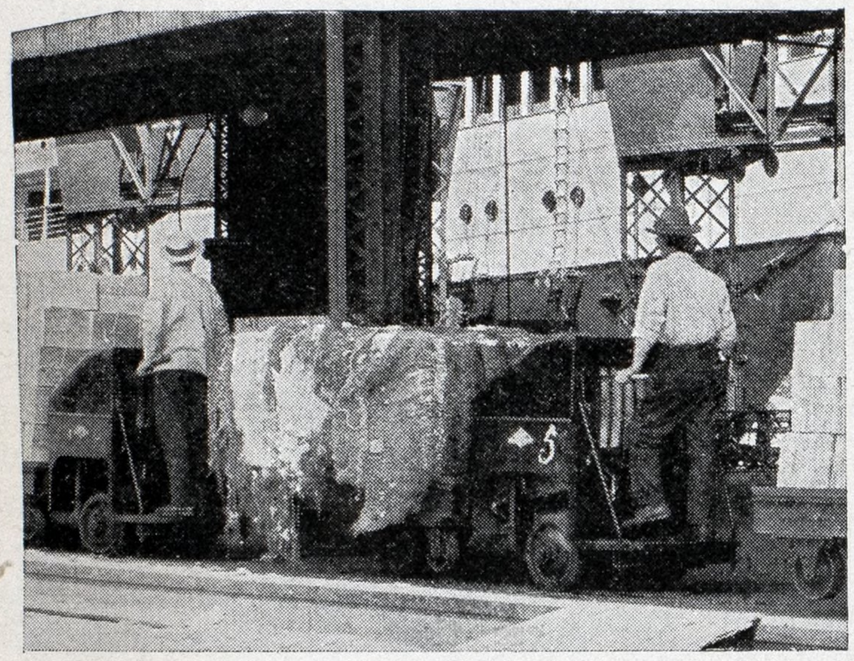
THERE IS A TEXACO LUBRICANT FOR EVERY PURPOSE



When Major Spatz and his crew took the air at Los Angeles, to establish a record for continuous flight, the avowed intention was to "stay aloft till the engines wear out."

By re-fueling in the air a world's record was hung up of 150 hours,—showing remarkable endurance for engines of the refinement airplanes require.

FUELED IN FULL FLIGHT

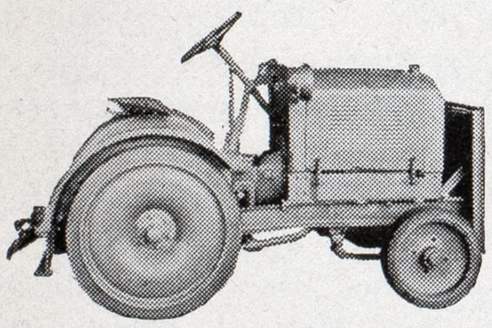


Clark Truclift loading cotton bales directly to the 'tween-decks at New Orleans.

CLARK TRUCTRACTORS Are Built to Exceed All Airplane, Steamship or Railroad Records for CONTINUOUS OPERATION



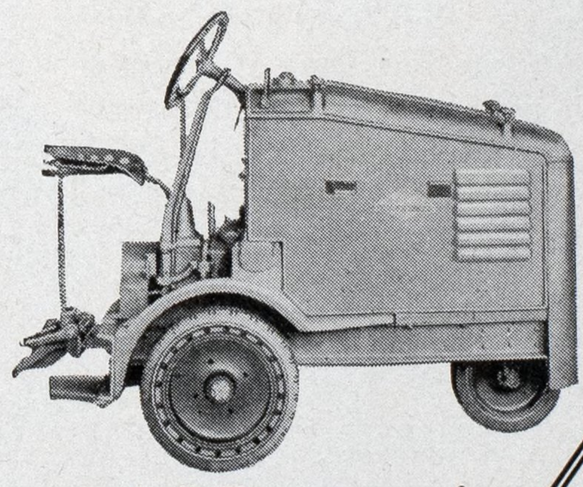
"Clarkat" towing trailer train from freight house to freight cars.



"Clarktor" Tructractor (4-wheel) for towing and pushing trailers.

THE assurance of Clark engineers that a Clark Tructractor could run uninterruptedly for weeks is *your assurance* of low maintenance cost and reserve power for long gruelling use. When scheduled sailing dates require cargo to be loaded night and day, freight handling by Tructractors is most efficient. Clark Truclifts, for example, lift skids and go directly aboard ship, depositing skids at the hatches or in the between-deck cargo spaces. Insurance underwriters have approved Clark gasoline propelled equipment for such use. The Clark Condensing Silencer converts exhaust gases to liquid before their escape.

Unbiased engineering surveys of Tructractor performance on the docks of leading transportation companies will tell you of the remarkable savings you can accomplish. Send the coupon.



"Clarkat" Tructractor, a 3-wheel towing model for trailer trains.

CLARK

CLARK TRUCTRACTOR CO.
Battle Creek, Mich.

TRUCTRACTORS

Reg. U. S. Pat. Office

are gasoline propelled and, therefore, competent for 24 hours' continuous service,—and just as potent in the last hour as in the first.

Clark Tructractor Co.

Please send certified engineering survey giving in detail the savings of Clark Tructractors, handling freight on docks and steamers.

Name .....

Company .....

Street and No. .....

City and State .....

MR-3-29



Inside on Costs on Handling Cargo

Within this book are twenty reports such as above.

Goodrich Transit Company tell how an $80,000 saving in one year in handling cargo was made—an amount almost equivalent to the initial cost of the system.

Bush Terminal tell how twelve tractors serve over 3000 trailers at reduced costs over the usual methods used that are slow and wasting of labor.

Eastern Steamship Lines Inc., tell why after exhaustive investigation they decided on the use of tractors and trailers.

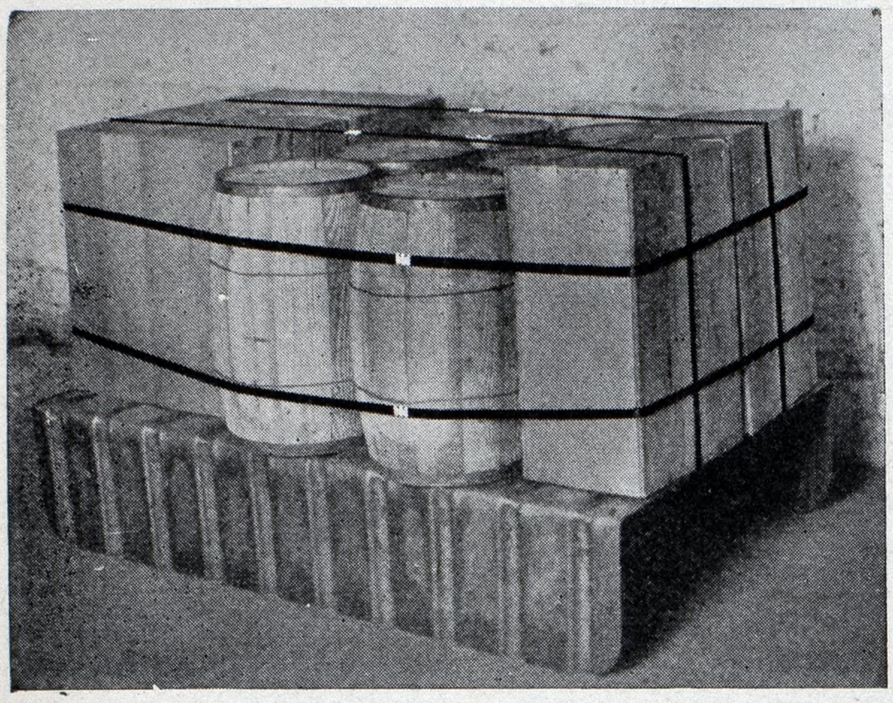
Fact is, this book gives you the inside facts on savings in cargo and freight handling written by the officials of docks and terminals themselves in a way that shows its adaptability and value that is clear, concise, believable.

You should have a copy for ready reference. Write for yours today—now and see how simple it would be to change a high cost operation into a means of increased profits through savings.

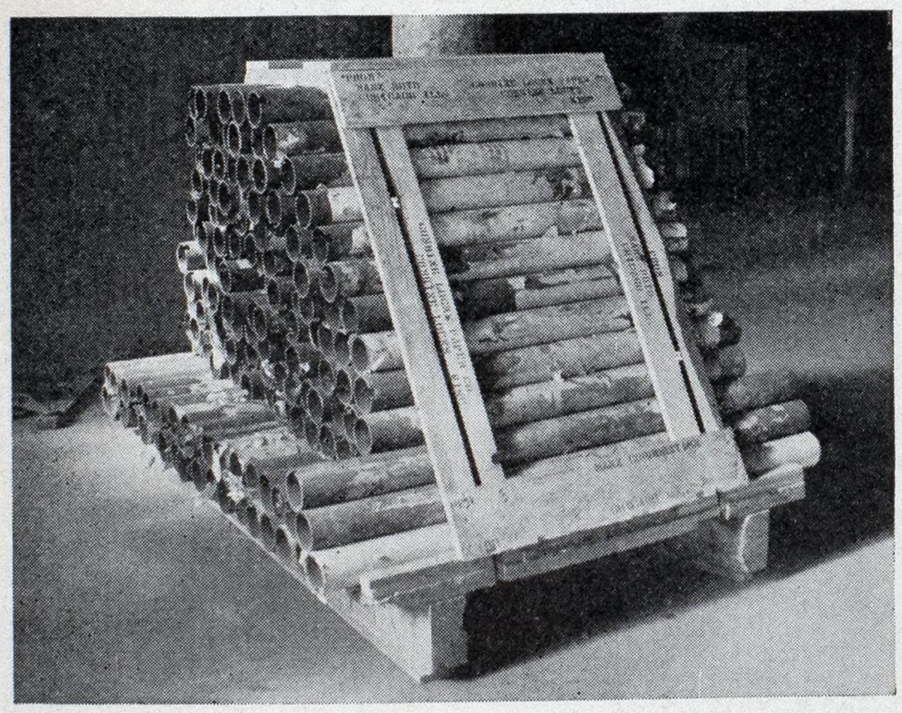
Mercury Manufacturing Co.
4160 So. Halsted Street
Chicago, Illinois

Mercury
Trackless Train

No Other Method of Handling Shipments Offers Such Tremendous Advantages



Mixed load of boxes and kegs strapped to a pressed steel platform for L. C. L. shipment. There is no chance for any part of this shipment going astray.



Iron cores from rolls of Rotogravure Paper strapped to wooden skid for return shipment to the paper mill. Weight 3600 pounds—one handling, and only one shipping label instead of one hundred and fifty.

Shippers, Receivers and Carriers Benefit

SKID shipping lowers the cost of distribution through savings in packing material, labor and handling time.

Its possibilities are unlimited. A large railroad company whose stores department handles over 100,000 items finds that eighty percent of its shipments can be forwarded more economically and efficiently on skids than otherwise. An automobile company reports that they can unload a carload of crank shafts on skids in 45 minutes at a cost of $1.00, whereas it formerly required 8 men 7½ hours at a cost of $24.00. A paper mill, by strapping sheet stock on skids is saving $5.00 on every ton they ship, or $36,000 a year.

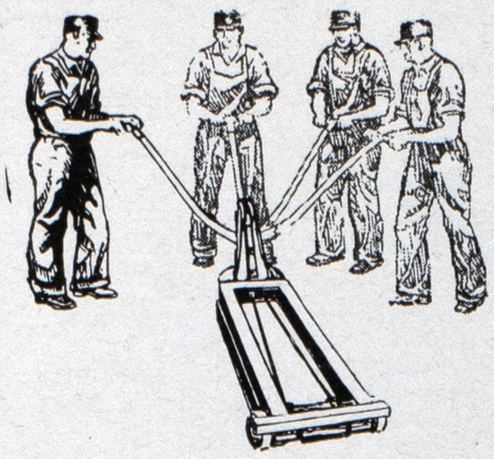
Acme Nailless Band Method

The speed and ease of securely fastening loads to skids with Acme Nailless Band and Tools has so simplified what was formerly a slow and costly job that there no longer is "anything to it". The job is done quickly and at very low cost. High tensile strength, specially tempered Acme Bands insure perfect safety to the load.

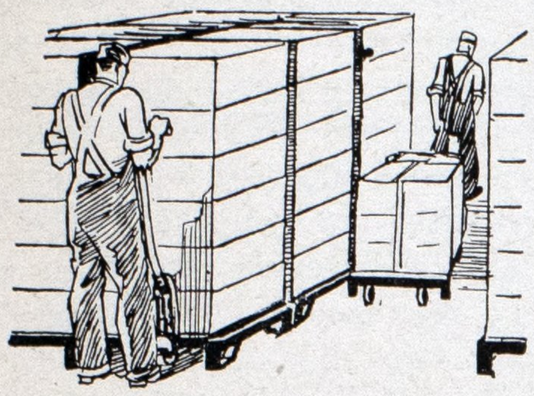
The services of Acme representatives, located in branches throughout the country, are available to any shipper or carrier interested in skid shipping.

ACME STEEL COMPANY

General Offices: 2840 Archer Avenue, Chicago, Ill.



You can operate a Jacklift with the handle at any angle in an arc of 270°. This is a great advantage in transferring or storing freight on deck, dock, or in warehouse.



The Jacklift elevates and lowers loads vertically — no sagging back and bumping of adjacent loads. You can spot loads closer—save room, and avoid accidents and damage with the Jacklift. The Jacklift is the only truck with this operating advantage.



High Lift—The Jacklift gives a higher lift than any other truck. This high lift allows sufficient clearance under the skid to prevent running aground on gang planks or ramps. Danger and delay are eliminated when you use Jacklifts.



In cramped quarters, the side lift of the Jacklift is indispensable. It will elevate the load in minimum space and narrow aisles. Never cornered by stanchions or posts. Lifts the heaviest loads with short easy strokes of the handle.

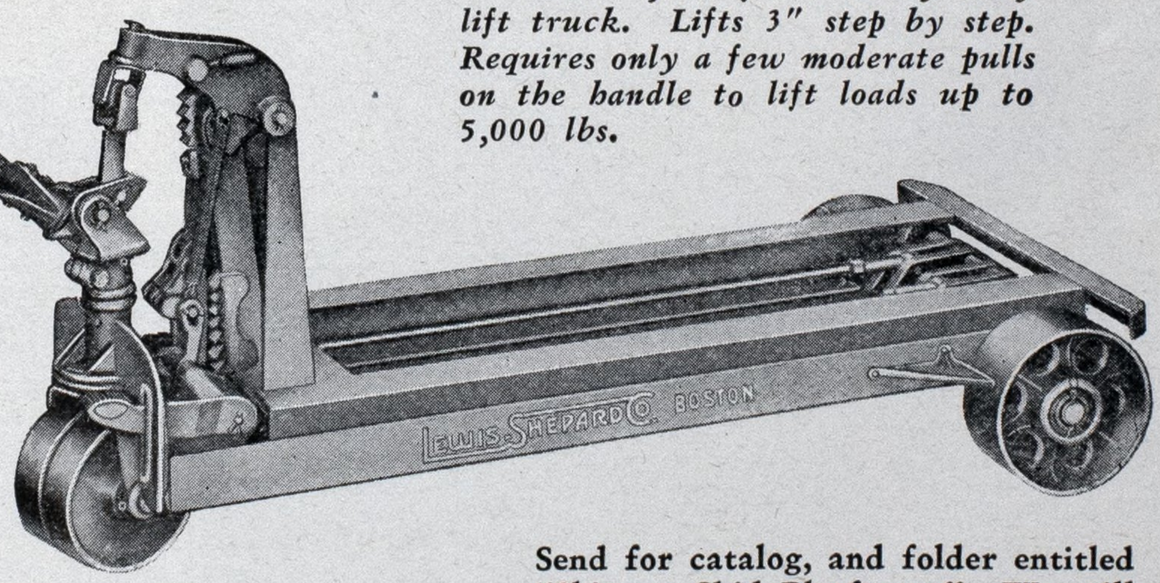


USE JACKLIFTS and Skids

Increase Your Truck and Sling Loads

Save 20% to 70% and More of Your Handling Costs

IMPORTANT STEAMSHIP LINES are fast coming to use lift trucks and skids to increase units loads and eliminate rehandling. The Jacklift is ideally suited for this work. Its three point suspension (twin wheels close together in front) make it easier and safer to manoeuver loads on rough dock floors. The high lift of the Jacklift eliminates trouble on inclines. The vertical release check requires no attention and lowers every load without shock. The "handle to the side lift" makes the Jacklift the best lift truck for handling freight in cramped quarters under the severe conditions imposed by this service. Jacklifts are now used with great satisfaction on this type of work. Send for the facts.

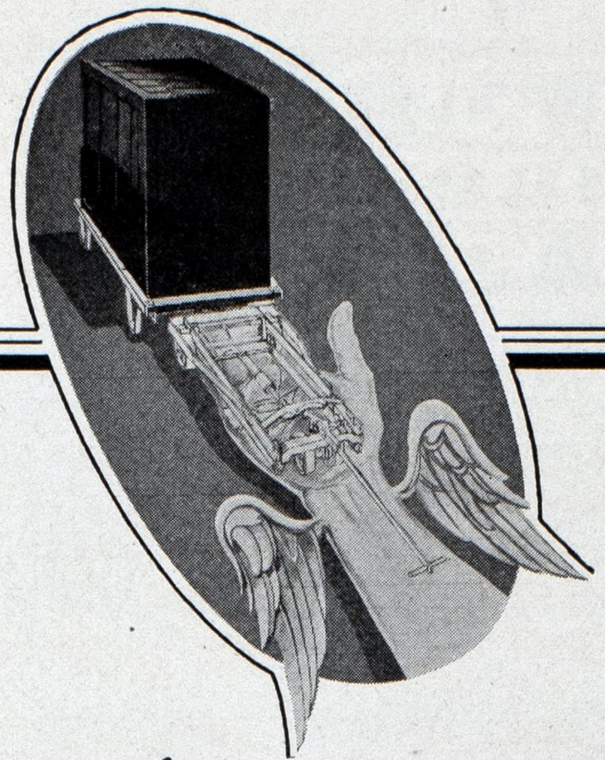


Model HL Jacklift—a heavy duty lift truck. Lifts 3" step by step. Requires only a few moderate pulls on the handle to lift loads up to 5,000 lbs.

Send for catalog, and folder entitled "Ship on Skid Platforms." We will also send you the facts about our present dock installations.
Lewis-Shepard Company, 170 Walnut Street, Watertown Sta., Boston, Mass.

LEWIS-SHEPARD

Many Large Manufacturers are Shipping their Goods on Lewis-Shepard Skid Platforms.



As W. C. Stuebing has Stated,
"America IS shipping on skid platforms"–

Because it is more economical up to 90%,
—Reduces Handling more than half,
—Eliminates damage and loss,
—Speeds up delivery,
—Eliminates demurrage charges.

Are you shipping this way *Internationally* and *Inter-departmentally?*

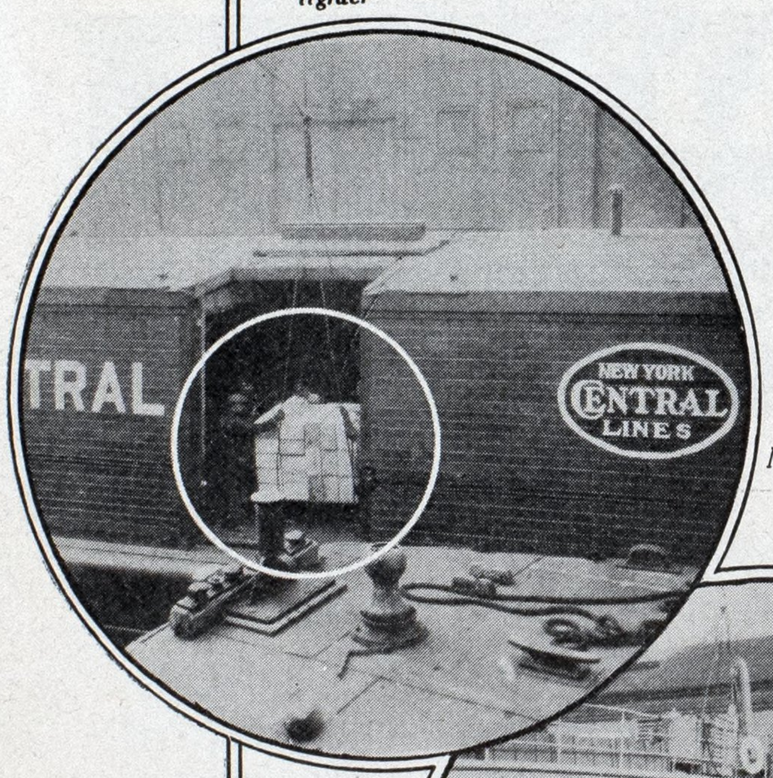
If not - then you are not handling *your* materials to your *best advantage.*

Have

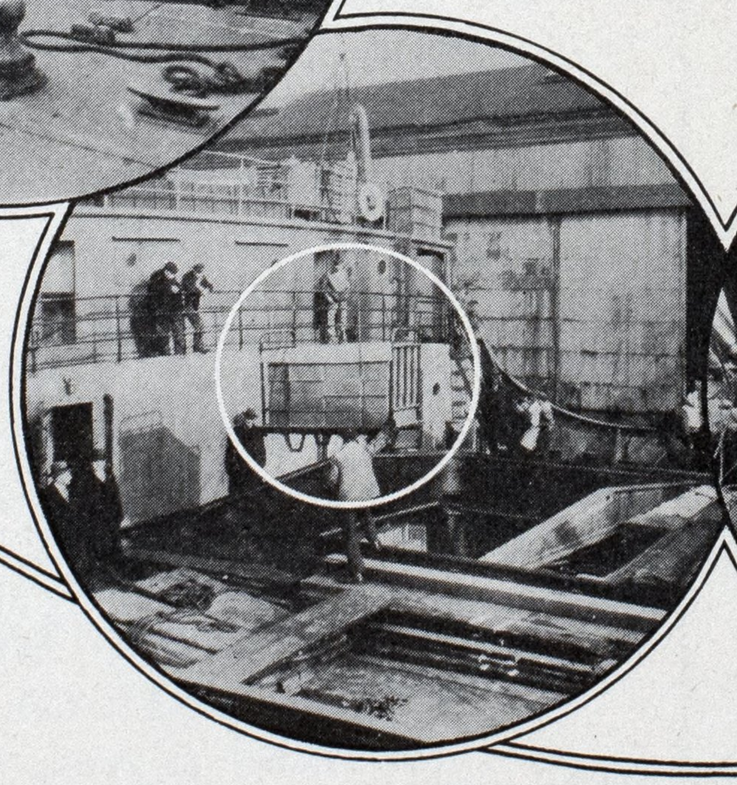
Leeds, Tozzer & Co.
75 West Street
NEW YORK CITY

explain to you the possibilities of this system.

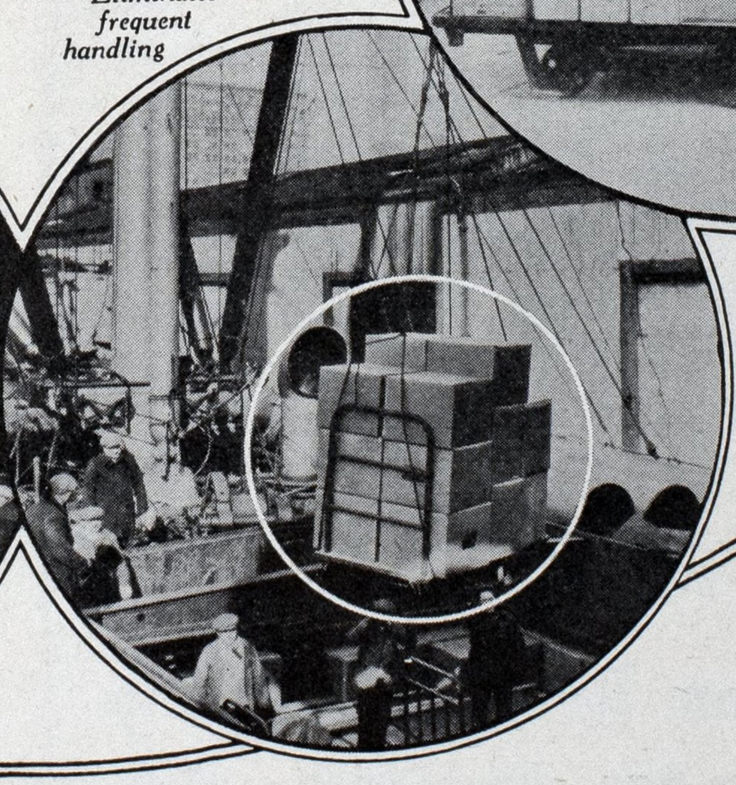
Removing from New York Central Lines lighter



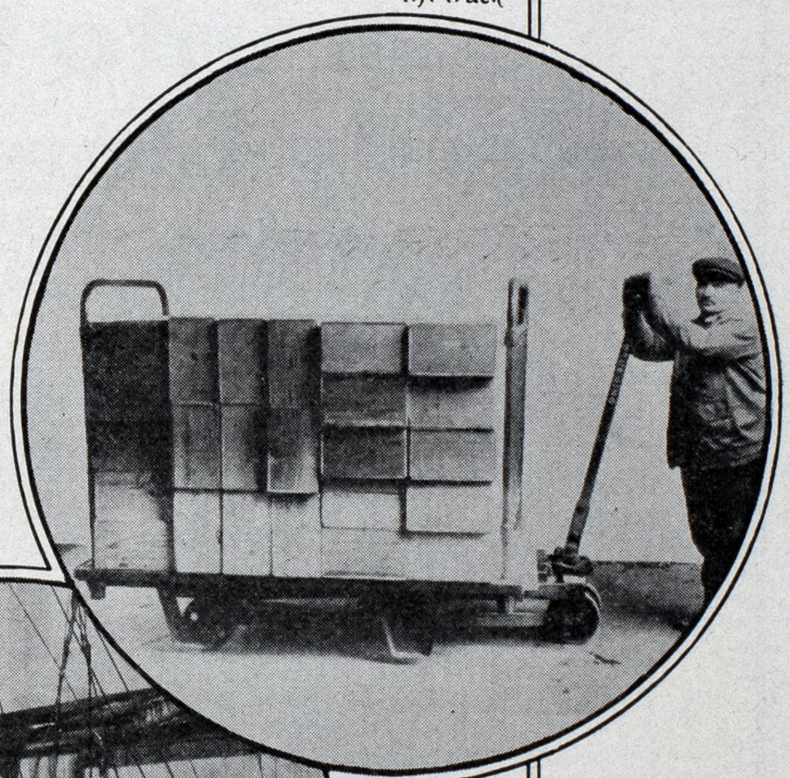
Lowering into a Munson-McCormick Line Ship

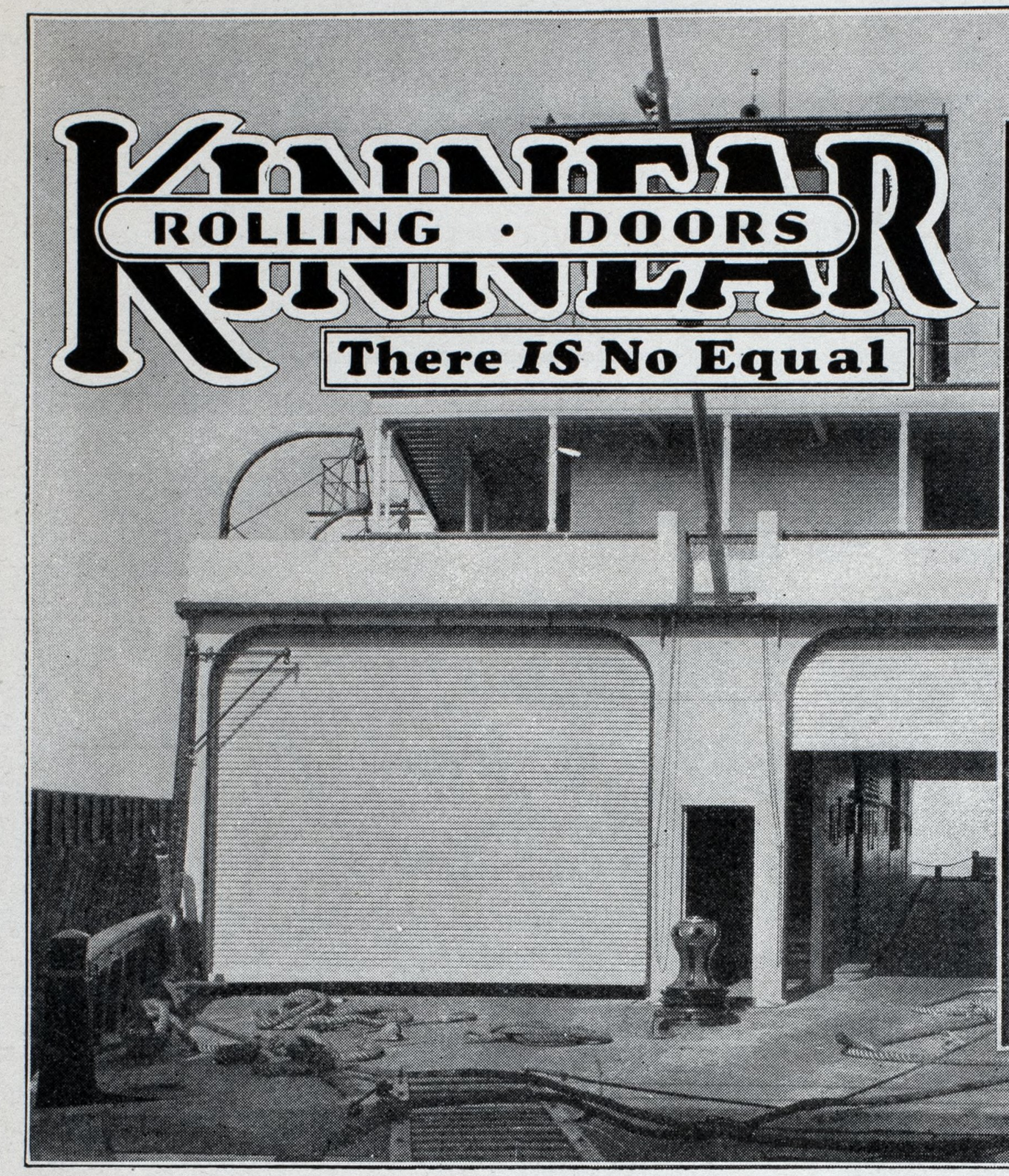


Eliminates frequent handling



A Stuebing Cowan lift truck





DOOR Efficiency

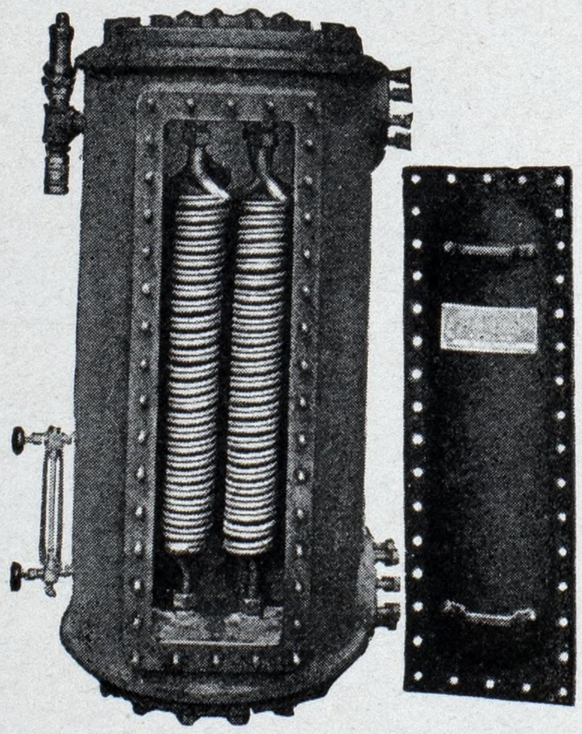
On land or at sea no other type of door can take the place of Kinnear Steel Rolling Doors. Where salt water is so detrimental to nearly all metal construction, the rugged steel, heavily galvanized Kinnear Slats safeguard against corrosion. Down, they withstand the severest elements. Raised, they are out of the way—out of sight—saving space so valuable in loading and unloading. Investigate! Write for catalog and request our Sales Dept. for bid on Kinnear Doors for your present or planned structures.

Branch offices in Principal Cities

The Kinnear Manufacturing Company

16 Field Ave., Columbus, Ohio

Look into the Reilly Heater



Note how little space it occupies; how easily inspected; how each coil is shaped like a spring, preventing expansion strains on the joint.

There are many other advantages of the Reilly Heater that you will be interested in reading about. Send for bulletin.

The Griscom-Russell Company

285 Madison Ave., New York

Chicago office: Monadnock Bldg.

Branch offices in principal ports

NATIONAL Diesel Engine Forgings

We manufacture High Grade Carbon and Alloy Steel Forgings, furnished smooth forged, rough turned, heat treated and finished complete; specializing in Diesel Engine Forgings, Hollow Bored Forgings, rough or finished bored, and Ordnance Work.

National Forge & Ordnance Co.

IRVINE, WARREN CO., PENNA.

Bell Phone: 55 Youngsville, Pa.

Branch Offices

Chicago Cleveland New York Detroit

The New York Shipbuilding Company Launches the First Cruiser Built Under the Terms of the Washington Treaty



The keel of the U. S. S. SALT LAKE CITY was laid on June 9th, 1927 and according to present plans the cruiser will be commissioned the latter part of this year.

THE U. S. S. SALT LAKE CITY which was launched on January 23rd, 1929, is the first cruiser launched in this country under the terms of the Washington Treaty signed at the Limitation of Armament Congress in 1922. This is one of a programme of eight which was authorized by act of Congress in December 1924.

The dimensions of the SALT LAKE CITY *are:*

Length	585 feet 6 inches
Extreme breadth	65 feet 2 inches
Normal draft	19 feet 6½ inches
Displacement	10,000 tons

She will be equipped with water tube boilers and propelling machinery of the turbo-geared type.

The cruiser CHESTER, a sister ship whose keel was laid only last year, is now under construction on adjoining building ways at the same shipyard.

IT will be remembered that the New York Shipbuilding Company recently completed and delivered to the Navy Department, the U. S. S. SARATOGA. This ship, an airplane carrier, the most powerful ship of her type in the world, proved herself under government test a few weeks ago as the fastest capital ship afloat.

NEW YORK SHIPBUILDING COMPANY

CAMDEN NEW JERSEY

GREATER EFFICIENCY AND LONGER SERVICE

at no additional cost

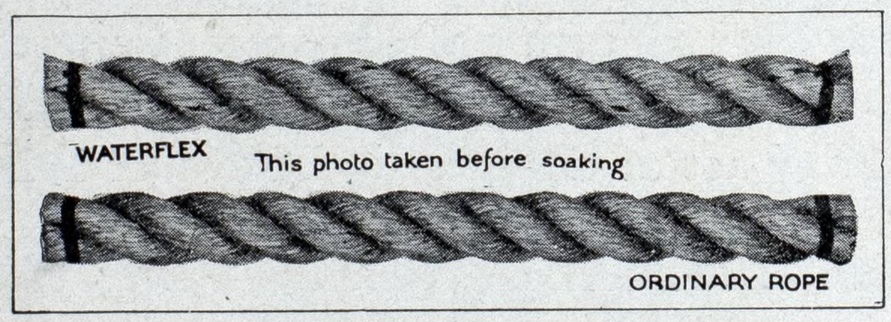
THE LAST WORD in rope efficiency is **WATERFLEX.** Its water-resisting qualities have been proven in the most difficult kinds of service, with expressed satisfaction.

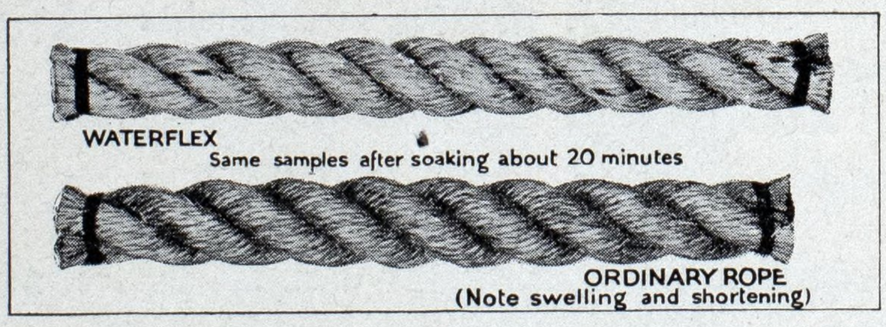
Dampness, rain or continued immersion in water have practically no effect upon **WATERFLEX,** which remains permanently lubricated and flexible at all times.

WATERFLEX does not swell, harden or kink when water-soaked. Its ease of handling and splicing, *wet or dry,* will amaze you.

WATERFLEX CORDAGE is manufactured under exclusive Whitlock patents and supervision, and offers you many outstanding advantages at no extra cost.

The following photographic reproductions of a soaking test tell their own story—





Why not try out a coil of **WATERFLEX** and judge it for yourself?

WHITLOCK CORDAGE COMPANY

46 South Street, New York

Factory and Warehouses
Jersey City, N. J.

Branches
Chicago, Boston, Kansas City *and* Houston

MOTOR BRUSHES BOILER GRAPHITE
CUP GREASE PIPE JOINT COMPOUND
FLAKE GRAPHITE SILICA-GRAPHITE PAINT
WATERPROOF GREASE

for maintenance—

DIXON'S GRAPHITE PRODUCTS

In its place, and using the right compound in the right place *Graphite* has no equal.
It has been the accepted privilege of the Joseph Dixon organization to spread the gospel of the proper use of *Graphite* and *Graphite Compounds* to the end that maintenance cost may be held at a minimum thru the better operation and longer service that each Graphite protected part *must* render.
Power plants find in Dixon's Line products of unusual merit. The carefully graded *Flake Graphites*—each with its special uses; the exactly compounded *Graphite Greases,* each with its place in every scheme of better lubrication; the *Boiler Graphites* for cleaning steam boilers; the Graphite Pipe Joint Compounds; the Silica-Graphite Paint with years of service on so many thousands of jobs; and Dixon's Belt Dressing, a non-graphite product which prevents belt slippage and increases power thru its use on leather, rubber, and fabric belts.

DIXON'S Solid Belt Dressing

Dixon's Engineers and research men have a background of 100 years of continuous service to draw from. They are at your service to give you the benefit of our wide and varied experience.

Write for booklet 81 *KP*

Joseph Dixon Crucible Company

Jersey City D X N TRADE MARK **New Jersey**

Established 1827

BATH WILL ALWAYS BUILD GOOD SHIPS



Established 1890

BATH IRON WORKS CORPORATION

BATH, MAINE

Unexcelled facilities for the Construction of Fine Steel Yachts up to the largest size



TODD SHIPYARDS CORPORATION has always kept abreast of the highly specialized needs of the Marine Industry, and through its unsurpassed equipment has afforded owners and operators of the most prominent trans-atlantic and coastal lines a unique Service in building, conversion, reconditioning, repair.

TODD SHIPYARDS CORPORATION

25 Broadway, New York

Twenty-Two Floating Docks—Two Graving Docks—Twelve Shipways

Robins Dry Dock & Repair Co.
Erie Basin, Brooklyn, N.Y.

Tietjen & Lang Dry Dock Co.
Hoboken, N. J.

Todd Shipbuilding & Dry Dock Co., Inc., *Mobile, Ala.*

Todd Engineering Dry Dock & Repair Co., *New Orleans, La.*

Todd Dry Dock Engineering & Repair Corp., *Brooklyn, N.Y.*

Todd Dry Docks, Inc.
Harbor Island, Seattle, Wash.

Todd Oil Burners, Ltd.
London, England

TODD
NEW YORK, U.S.A.

THE new Todd drydock under construction at its Robins plant, Erie Basin, Brooklyn, supplementing the other drydock service at this yard, will be the largest privately owned graving dock in andaround New York Harbor.

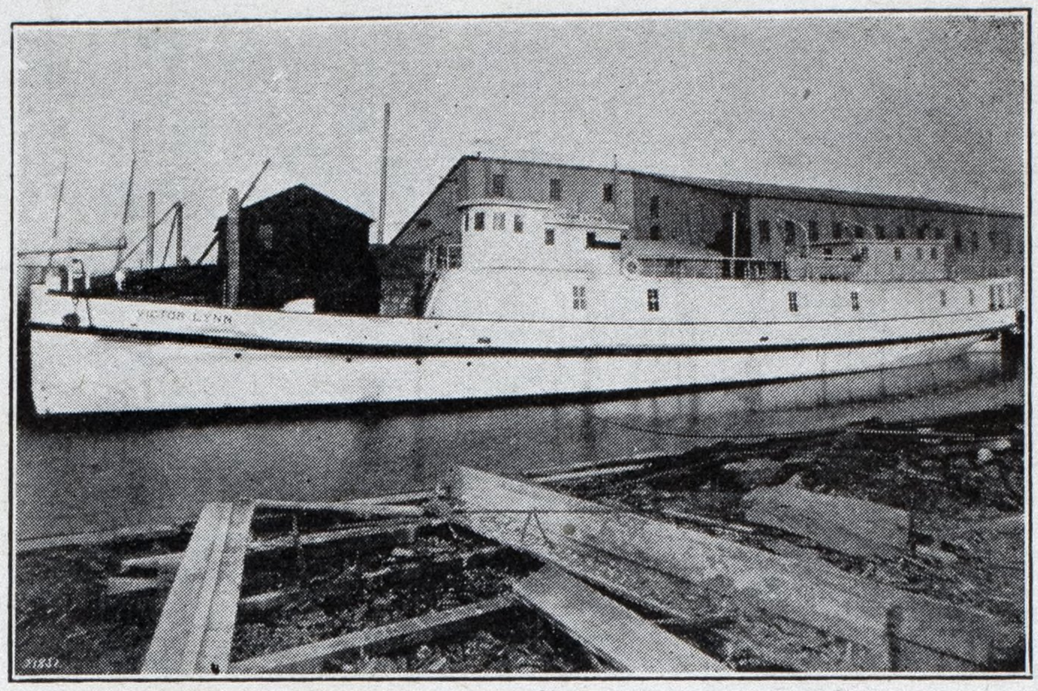
When completed this drydock will accommodate, with few exceptions, the largestvessels in transatlantic service.

The building of this new graving dock is in line with this organization's policy to have facilities for service that are unsurpassed in the Port of New York.

STANDARD-POWERED FREIGHTERS ARE RELIABLE

Owners of freight boats must give unfailing service. Standard Diesel Power will insure this success.

Here's the "Victor Lynn", powered by two 150 H.P. Standard Diesels which have never caused the owner, A. A. Wootten of Salisbury, Md. to miss a trip since the engines were installed in 1925.



Write For Catalog.

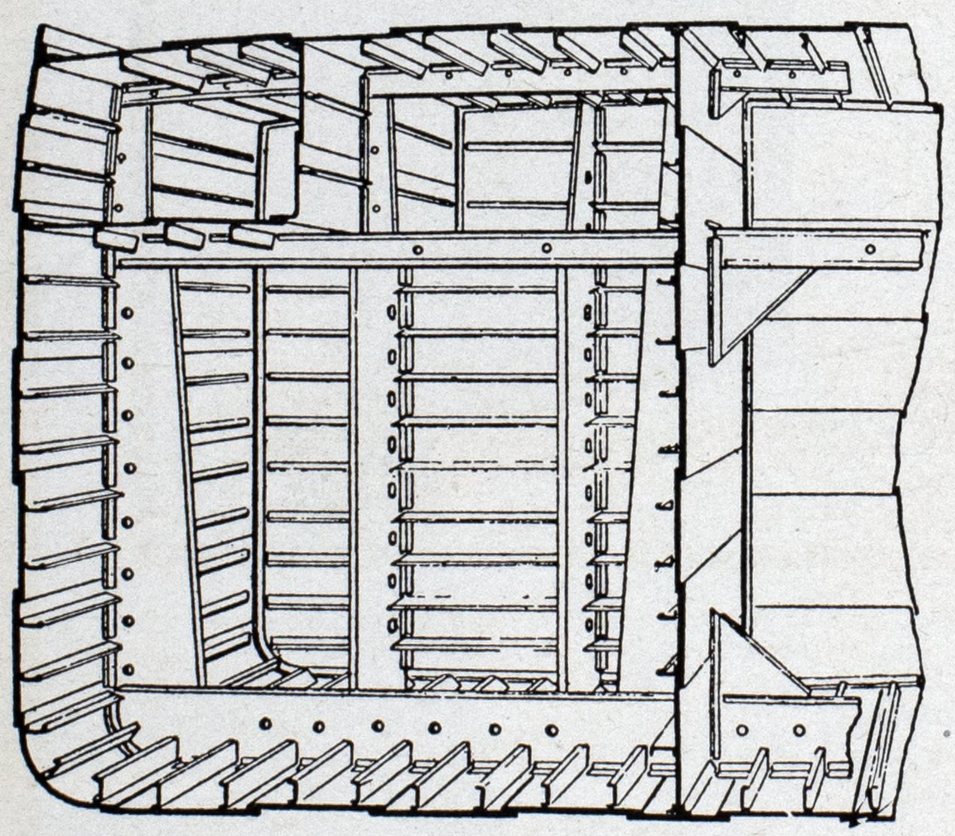
Standard Motor Construction Co.

184 Whiton Street **Jersey City, N. J.**

Progress in Oil-Tank Ship Construction

The "Bracketless-System"

(PATENT)



Eliminates Bulkhead Brackets
Eliminates Bulkhead Leakage
Greatly Simplifies Construction
Greatly Reduces Cost of Damage Repairs
Greatly Reduces Cost of Cleaning Tanks
Substantially Increases the Longitudinal Strength
Beyond the Well-tried "Isherwood System"

SIR JOSEPH W. ISHERWOOD & CO., Ltd.
17 BATTERY PLACE, NEW YORK
and 4, LLOYD'S AVENUE, LONDON, E. C. 3

1

Deck Seams



USE JEFFERY'S
No. 2 First Quality Marine Ship Glue

Clean out seams thoroughly—caulk seams well, leaving space for Marine Glue—keep dry and free from oil, dust and dirt—run melted glue into seams with paying shell or ladle allowing it to overflow a little—after several days remove excess with scraper.

The result will be a deck that will not worry you again for several seasons.

FOR HULL SEAMS: Ferdico Seam Filler.
UNDER CANVAS: Jeffery's C. Quality Liquid Glue.
FOR GARBOARD LEAKS: Jeffery's No. 7 Liquid Glue.

Send for free booklet on use of Marine Glue

L.W. Ferdinand & Co.
152 Kneeland Street. Boston, Mass.

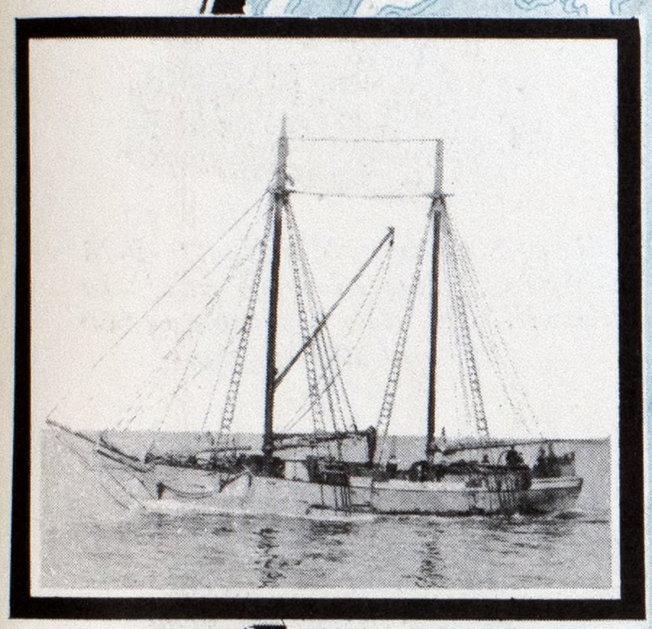


The tug, "Mahoe," bringing the "Hanover" into port at Honolulu. The "Mahoe" is powered with two 360 hp. Fairbanks-Morse Diesels

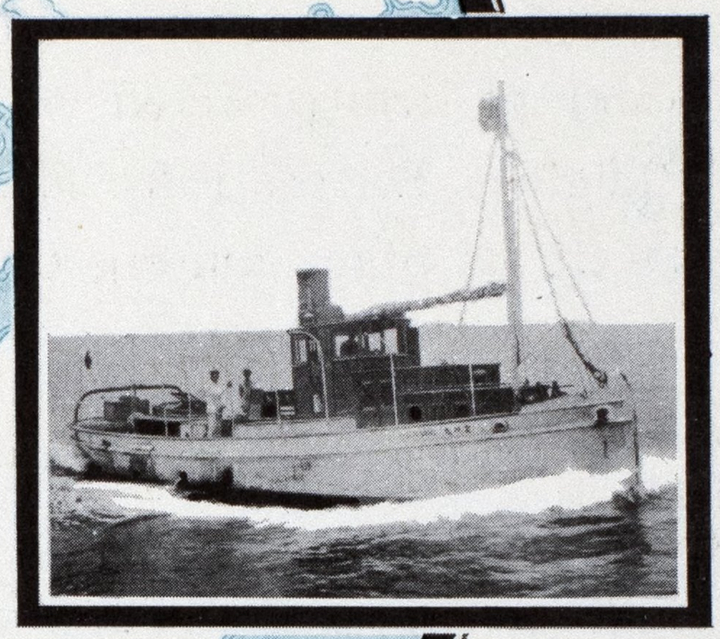


The "Iruna," a freighter owned by the Insular Navigation Company, plies between Cebu and Tacloban in the Philippines. Powered with a 180 hp. F-M Diesel

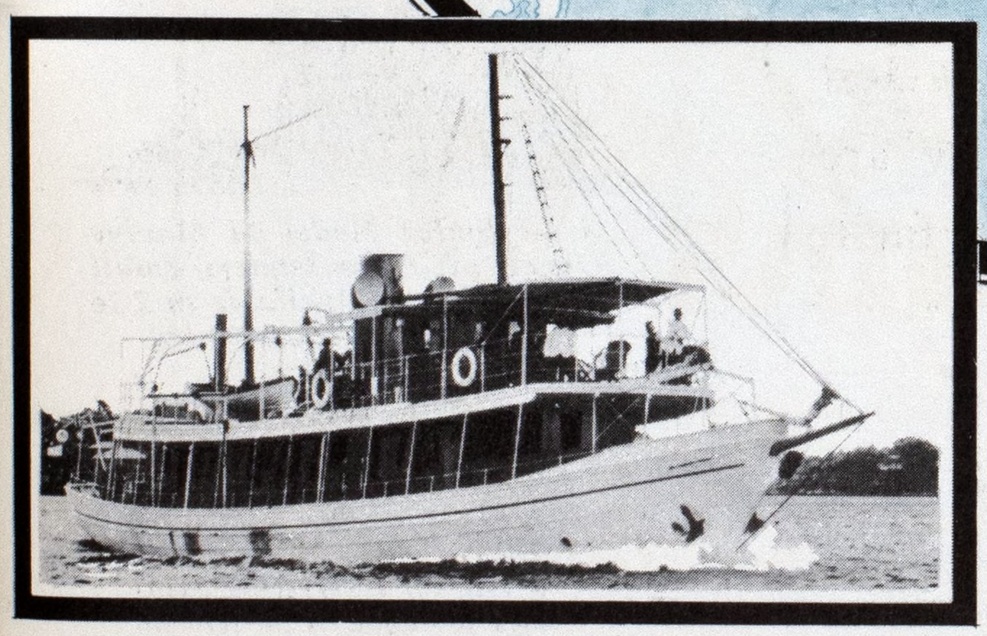
F-M DIESELS THE WORLD OVER



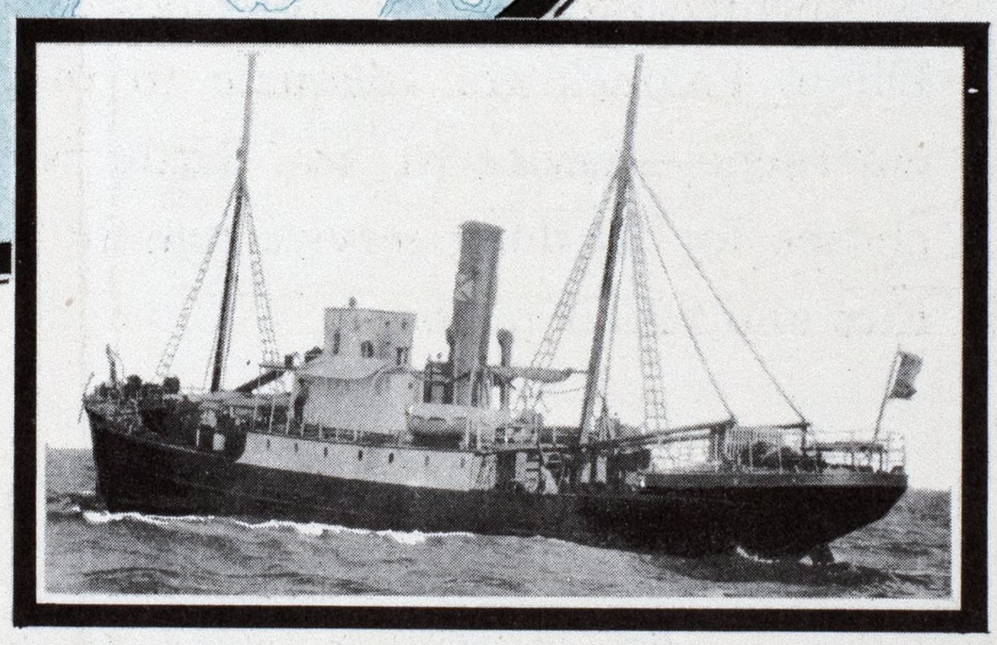
A New Zealand schooner, the "Kohi," in coastal service driven by two 45 hp. Fairbanks-Morse Diesel Engines



The Harbor Master at Yokohama uses the "Kinsen Maru," powered with a 100 hp. F-M Diesel



Way down in Papua, New Guinea, the local government employs the "Lauabada" which is equipped with two 100 hp. Diesel Engines



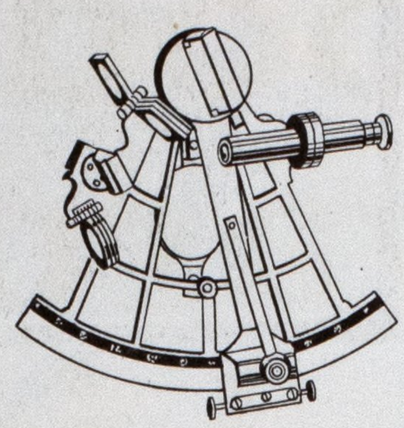
The "San Antonio" between Montevideo and Buenos Aires was recently powered with a 360 hp. F-M Diesel

POWER PUMPING AND WEIGHING EQUIPMENT

FAIRBANKS-MORSE DIESEL ENGINES

FAIRBANKS-MORSE DIESEL ENGINES

FAIRBANKS-MORSE DIESEL ENGINES



On the seven seas—

on the rivers of the world—ply craft of all types and all sizes powered with Fairbanks-Morse Diesel Engines. For the Fairbanks-Morse Diesel has earned well its place among the leading marine Diesel engines of the world.

A simple engine—two-cycle, with complete absence of poppet valves in the cylinder heads and cam shaft, tappets and other valve operating parts—a fuel injection system which eliminates high pressure fuel auxiliaries.

Sturdily built, simple in design—Fairbanks-Morse Diesel Engines are adequate to the everyday and emergency service at sea. Little wonder they are chosen for far flung service remote from shop facilities and repair ports.

FAIRBANKS, MORSE & CO., Chicago

General Offices: Chicago

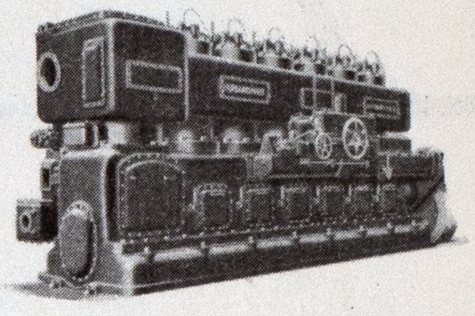
Branches with Service Stations in Principal Ports

An engine for practically all marine requirements

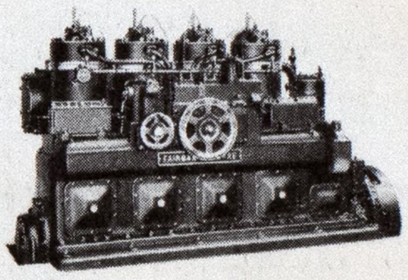
The Fairbanks-Morse standardized line of Diesel Marine Engines covers a range in single units of 800 hp. to 25 hp.

Practically every type of craft can be powered with these engines to obtain lower operating costs and increased service.

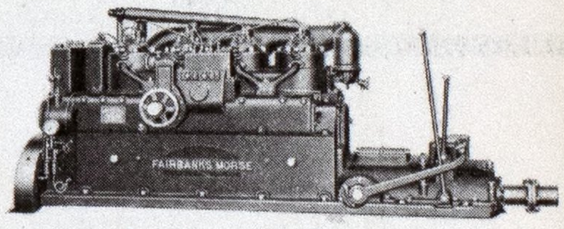
Also auxiliary Diesels furnishing either compressed air, electric current or both.



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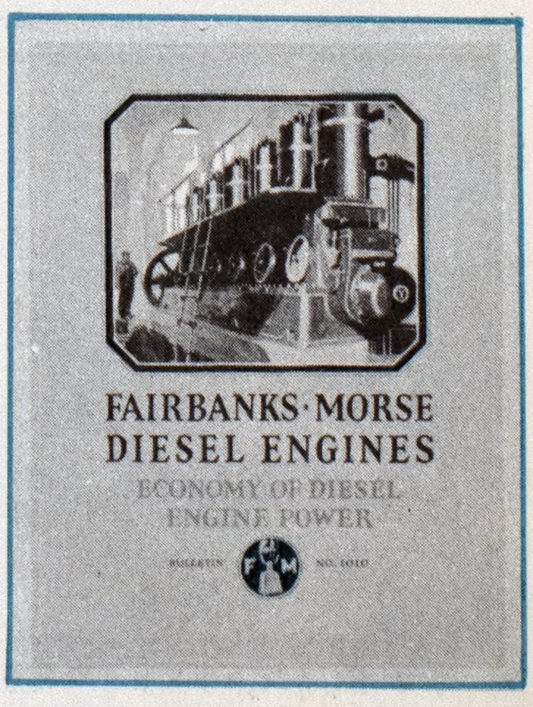


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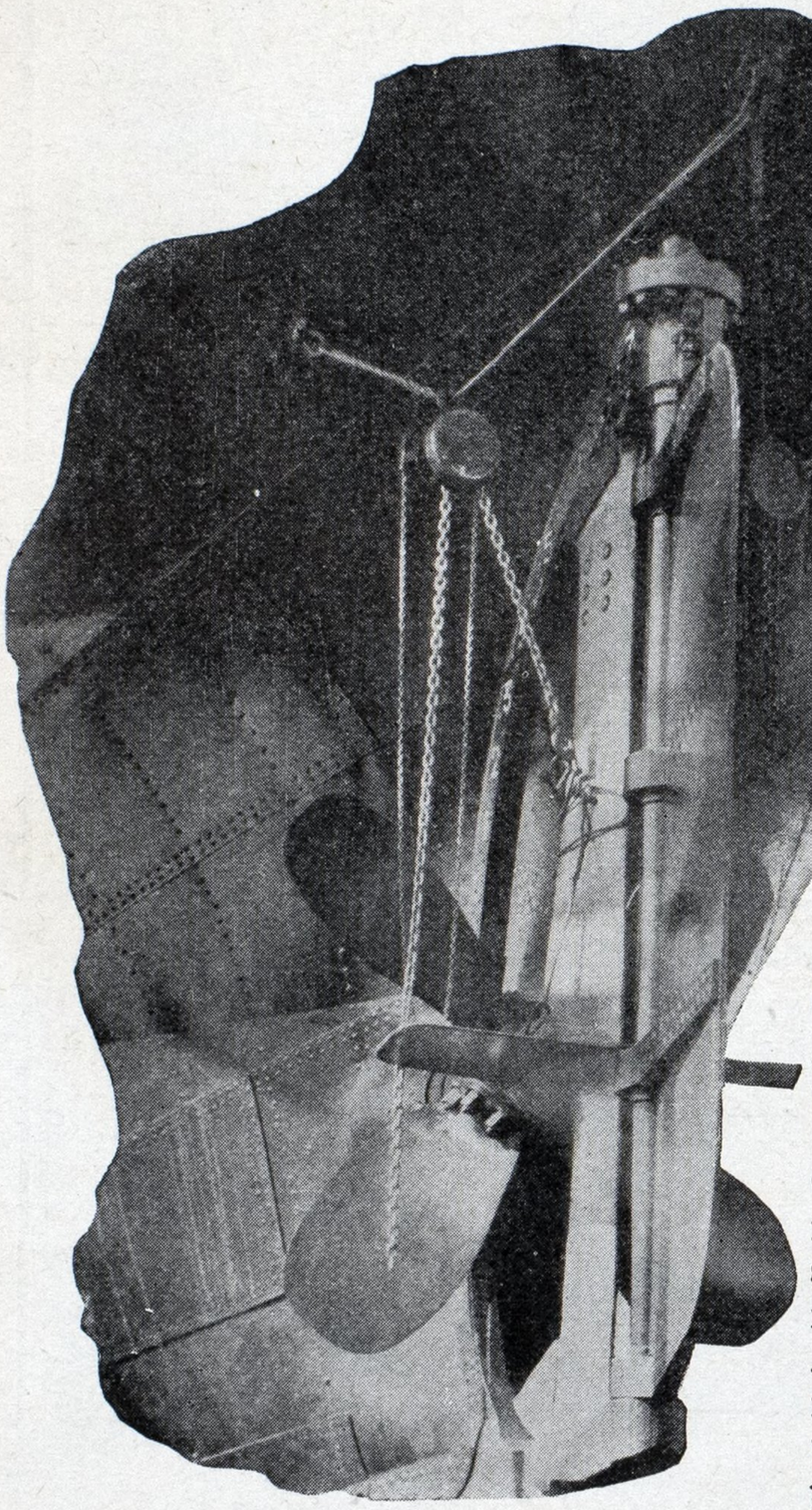
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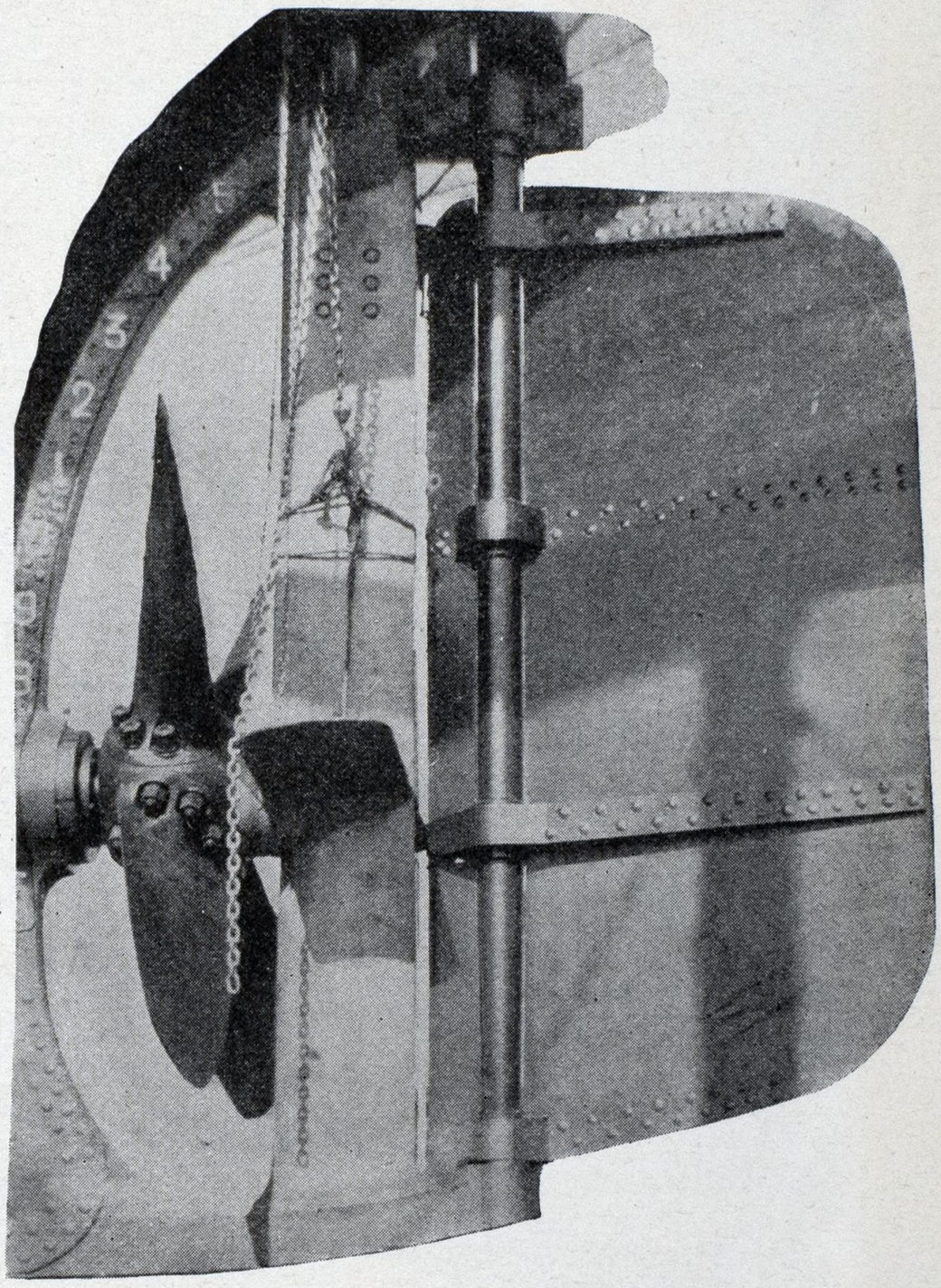
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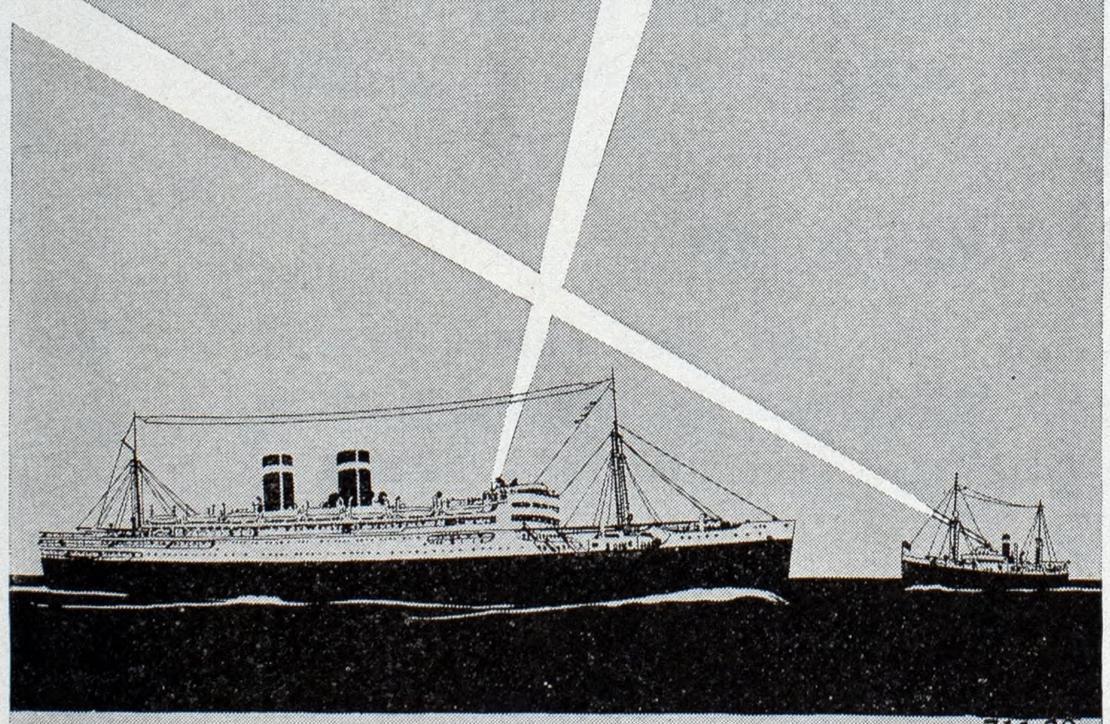
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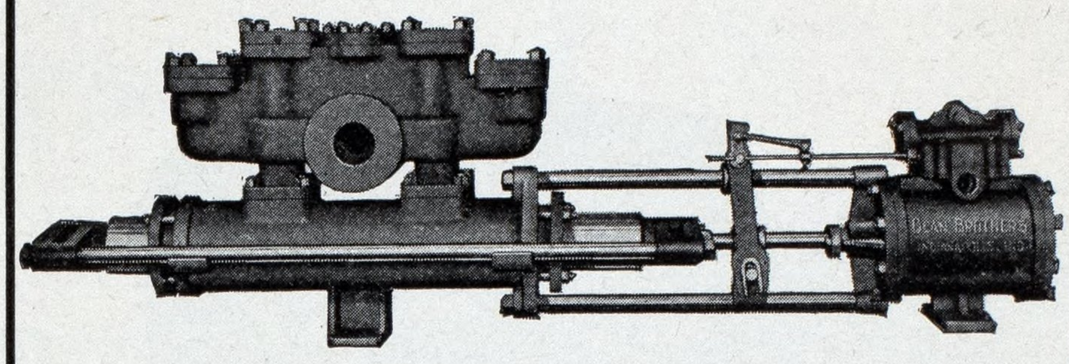
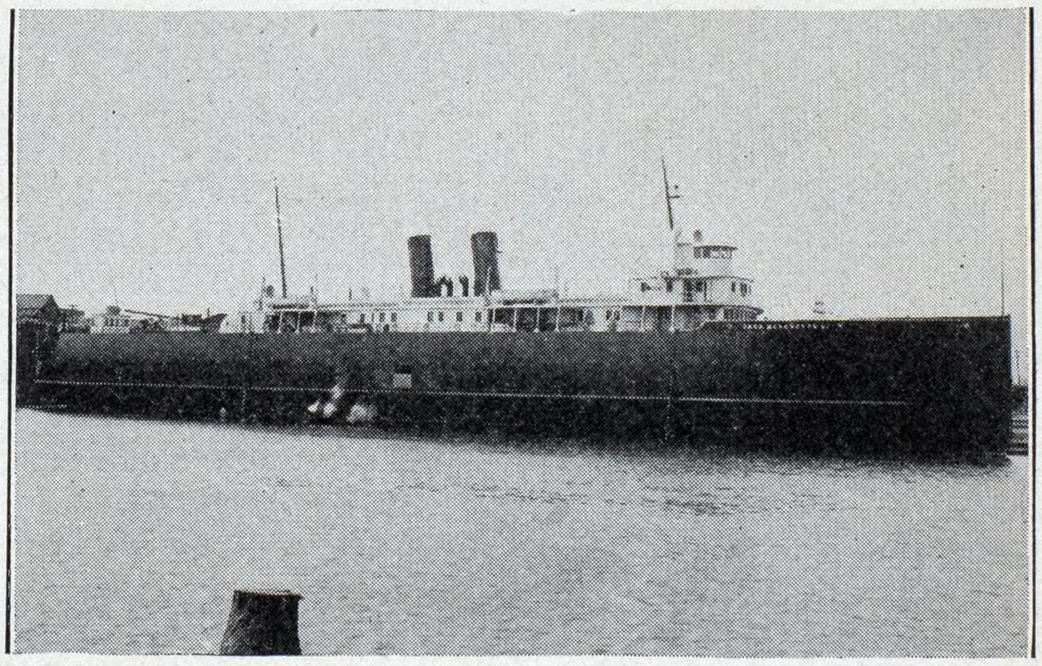


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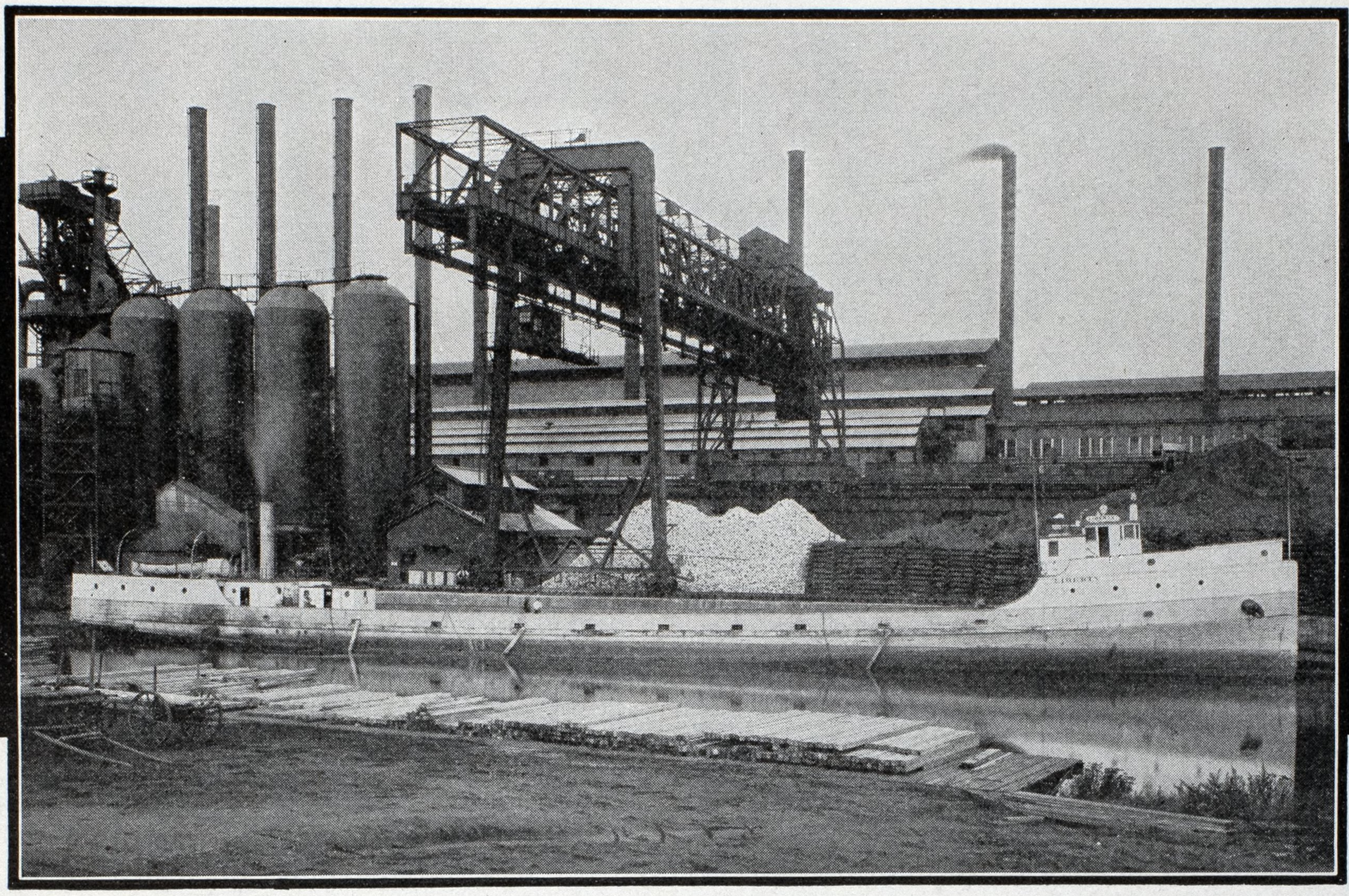
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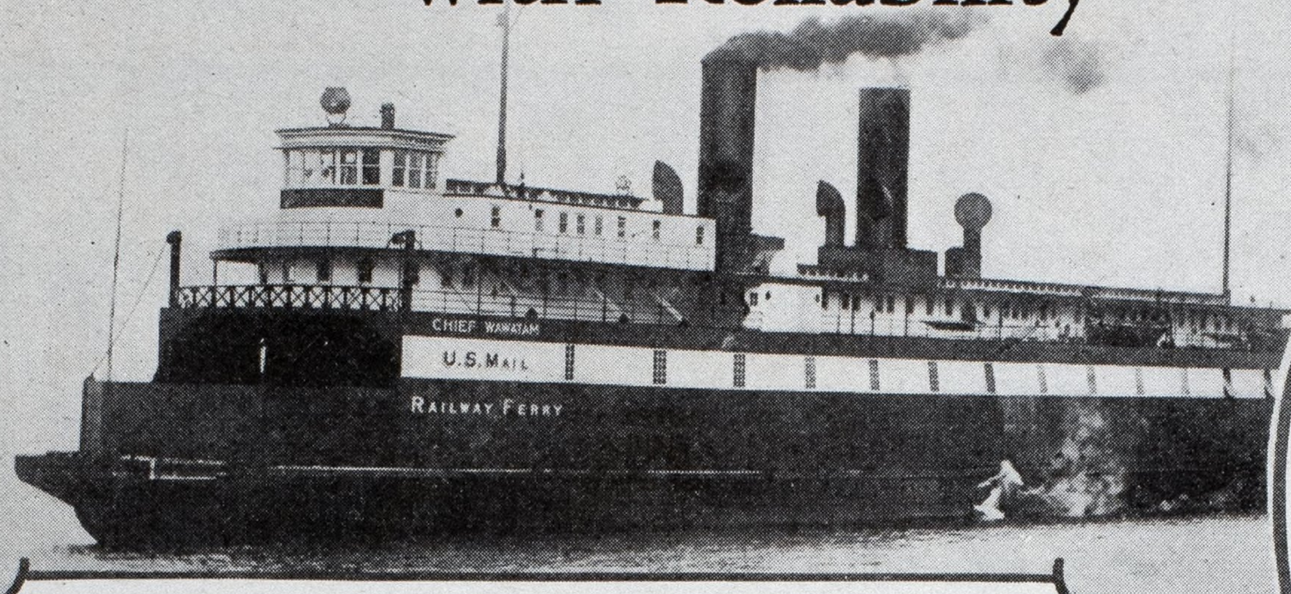
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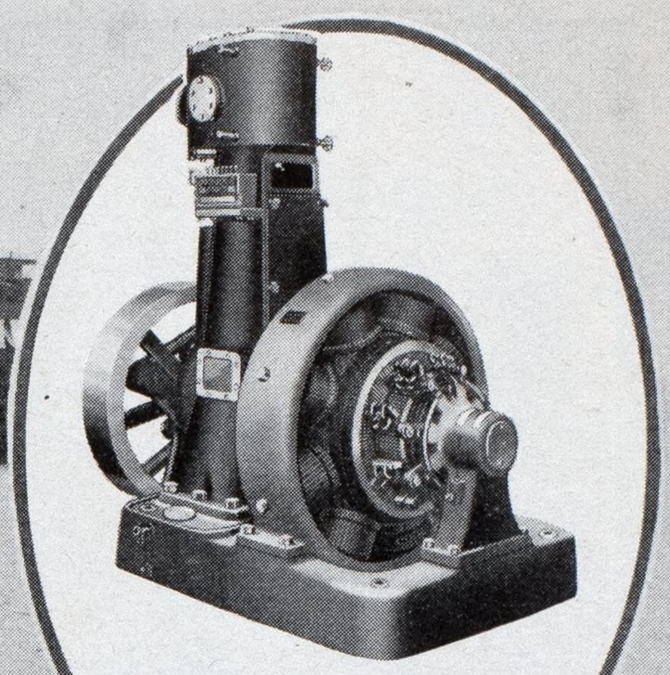
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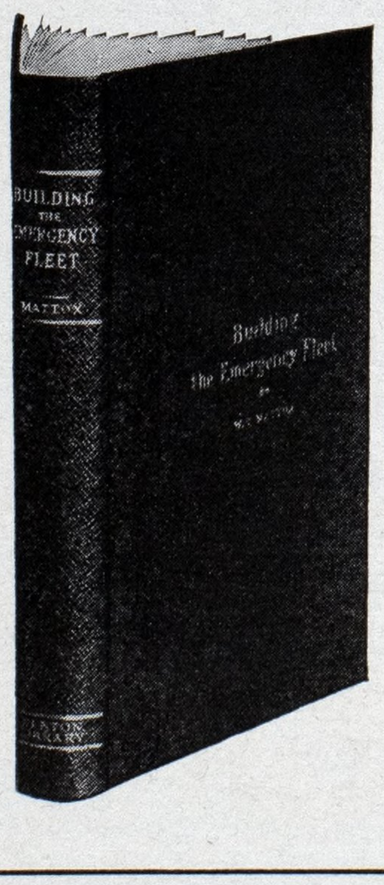
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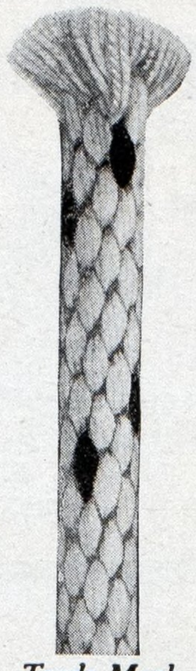
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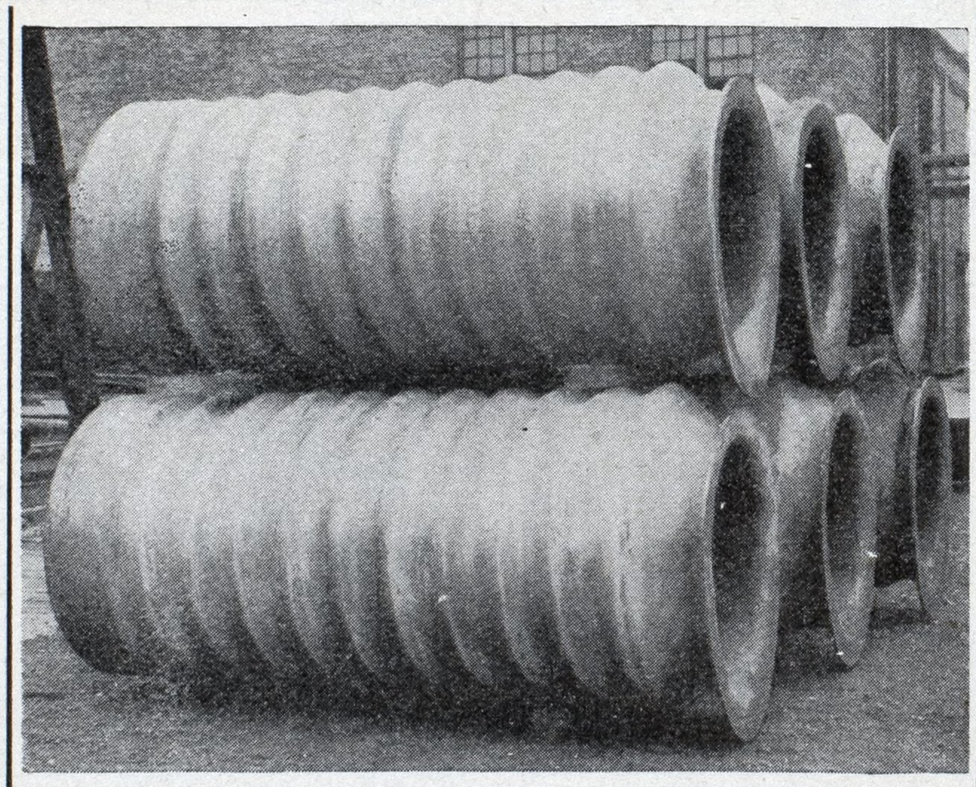
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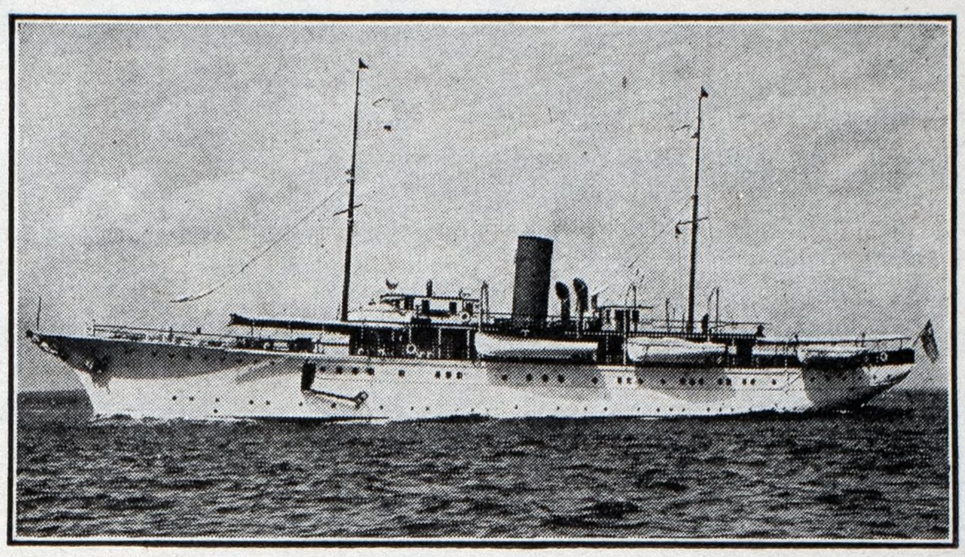
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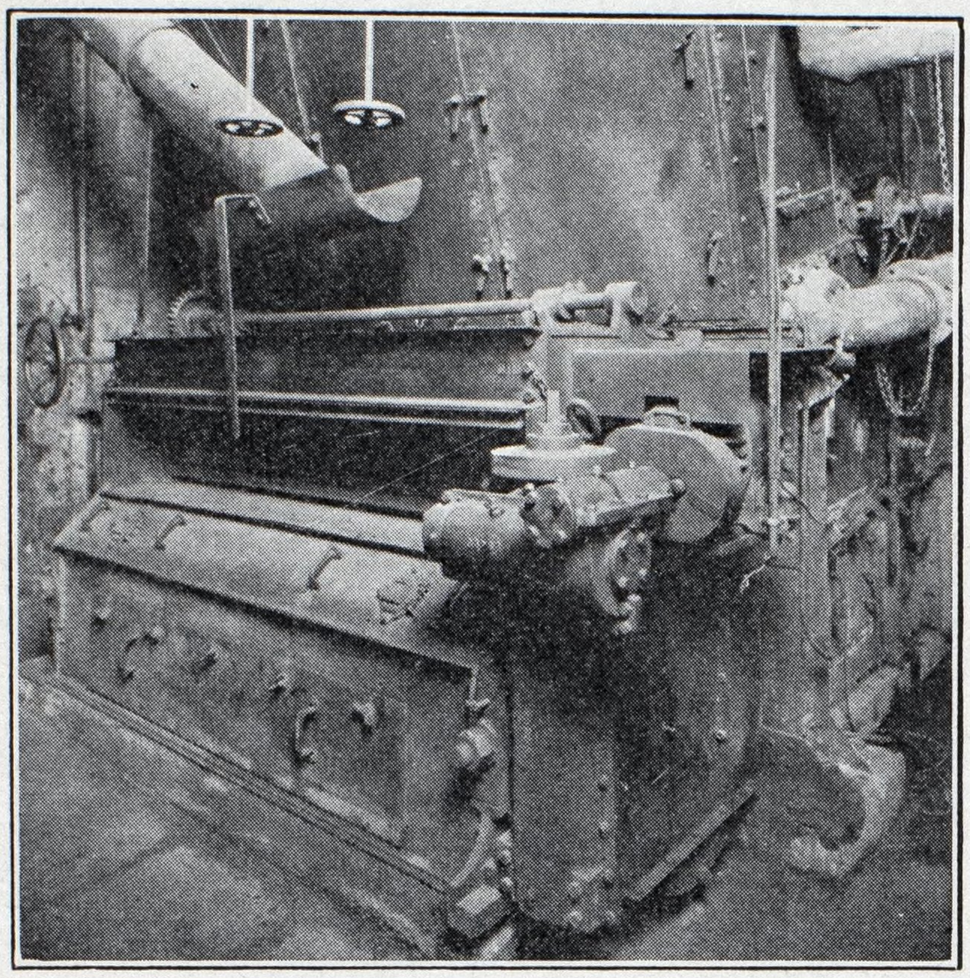
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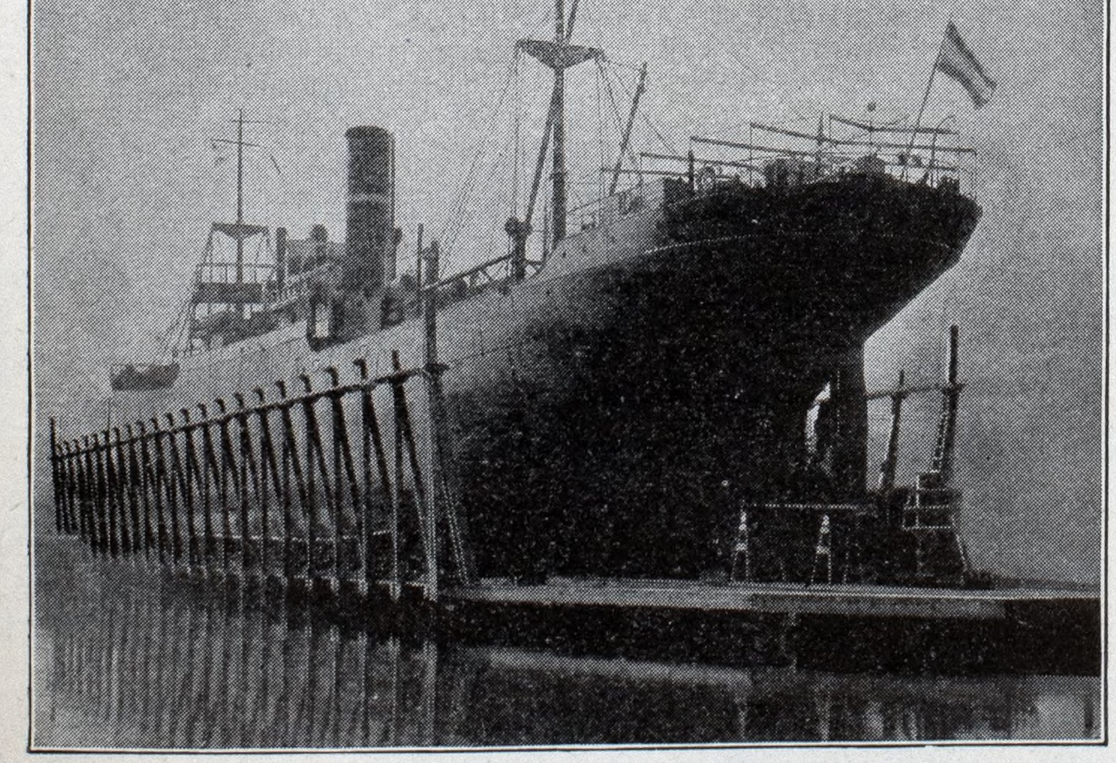
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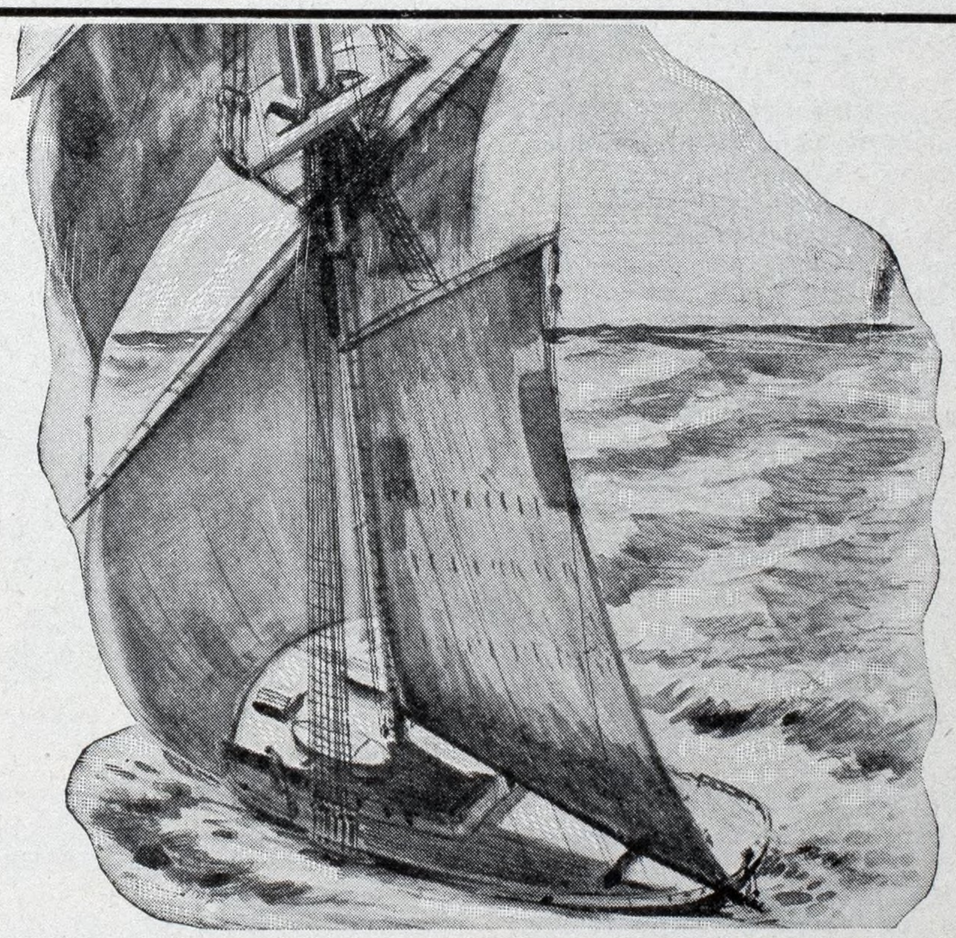
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The lookout who sights stormy weather in mid-ocean fears not wind or wave if deck, side and bottom seams are tight.

For one hundred years, shipmasters have depended on

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to keep seams tight against heaviest weather.

Stratford Oakum is the world's best. Manufactured by an organization whose principal idea is to make oakum better than anybody else can possibly make it.

Stratford Oakum "stays put" in the seams. Economical—wastage is practically eliminated. Saves labor costs in caulking or spinning. Is well-finished, well-tarred, clean and elastic enough to keep the seams tight under all conditions.

Be sure you use Stratford Oakum.

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JERSEY CITY, NEW JERSEY
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*1

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Busch-Sulzer Bros.-Diesel Engine Co., 2nd and Utah Sts.,
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Fairbanks, Morse & Co.,
900 South Wabash Ave.,
Chicago, Ill.
Ingersoll-Rand Co.,
11 Broadway, New York City.
McIntosh & Seymour Corp.,
Auburn, N. Y.
Standard Motor Construction Co.,
172 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Reciprocating)
Hooven-Owens Rentschler Co.,
Hamilton, O.

ENGINES (Steam, Steering)
Dake Engine Co.,
Grand Haven, Mich.

ENGINES (Vertical, Enclosed, Self Oiling)
Engberg's Electric & Mechanical Works, 22229 Vine St.,
St. Joseph, Mich.

EUROPEAN STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Line
39 Broadway, New York City.

EVAPORATORS
Griscom-Russell Co.,
285 Madison Ave.,
New York City.

FANS (Desk and Bracket-Oscillating and Non-Oscillating)
Diehl Manufacturing Co.,
Elizabethport, N. J.

FANS (Electric)
Diehl Manufacturing Co.,
Elizabethport, N. J.
General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

FANS (Ventilating)
Diehl Manufacturing Co.,
Elizabethport, N. J.

FEED WATER HEATERS—See HEATERS AND PURIFIERS (Feed Water)

FEED WATER REGULATORS
Babcock & Wilcox Co.,
85 Liberty St., New York City.

FIRE DOORS AND SHUTTERS
Kinnear Mfg. Co.,
816 Field Ave., Columbus, O.

FIRE EXTINGUISHER
American-LaFrance & Foamite Corp., Elmira, N. Y.

FIRE EXTINGUISHING SYSTEMS
American-LaFrance & Foamite Corp., Elmira, N. Y.

FIRE PROTECTION ENGINEERS
American-LaFrance & Foamite Corp., Elmira, N. Y.

FLANGES (Forged Steel Pipe)
American Spiral Pipe Works,
1440 S. 49th St., Chicago, Ill.

FLOORING
Selby Battersby & Co.,
810 Noble St., Philadelpiha, Pa.

FORGINGS (Diesel Engine)
National Forge & Ordnance Co.,
Irvine, Warren Co., Pa.
Titusville Forge Co., Titusville, Pa.

FORGINGS (Hollow Bored)
National Forge & Ordnance Co.,
Irvine, Warren Co., Pa.

FORGINGS (Steel)
National Forge & Ordnance Co.,
Irvine, Warren Co., Pa.

FOUNDERS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
New York Shipbuilding Co.,
Camden, N. J.

FREIGHT SERVICE
Hamburg-American Line,
39 Broadway, New York City.

FUEL OIL
Texas Co., The,
17 Battery Place, New York City
Vacuum Oil Co.,
61 Broadway, New York City.

FURNACES (Corrugated Boiler)
American Spiral Pipe Works,
1440 S. 49th St., Chicago, Ill.

GALLEY RANGES
Stamford Foundry Co.,
Stamford, Conn.

GAS (Acetylene Dissolved)
Prest-O-Lite Co., Inc.,
30 East 42nd St., New York City.

GAS (Nitrogen and Oxygen)
Linde Air Products Co.,
30 East 42nd St., New York City.

GAS (Welding and Cutting)
Prest-O-Lite Co., Inc.,
30 East 42nd St., New York City.

GEARS (Marine Equipment)
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATING SETS
Diehl Manufacturing Co.,
Elizabethport, N. J.
Fairbanks, Morse & Co.,
900 South Wabash Ave.,
Chicago, Ill.

GENERATING SETS (Direct Connected)
Engberg's Electric & Mechanical Works,
2229 Vine St., St. Joseph, Mich.
General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATORS
Diehl Manufacturing Co.,
Elizabethport, N. J.
Engberg's Electric & Mechanical Works,
2229 Vine St., St. Joseph, Mich.
Fairbanks, Morse & Co.,
900 South Wabash Ave.,
Chicago, Ill.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

GRAPHITE
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE GREASES
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE PAINT
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GRAPHITE PIPE JOINT COMPOUNDS
Dixon, Jos., Crucible Co.,
Jersey City, N. J.

GREASE
Texas Co., The,
17 Battery Place, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

GREASE (Launching)
Texas Co., The,
17 Battery Place, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

GYRO-PILOT (Automatic Steering)
Sperry Gyroscope Co.,
Brooklyn, N. Y.

HARDWARE (Marine)—See MARINE HARDWARE

HATCH FASTENERS
Mullholland Hatch-Fastener Co.,
Marion Bldg., Cleveland, O.

HAWSERS (Manila)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works,
Boston, Mass.
Whitlock Cordage Co.,
46 South St., New York City.

HEATERS AND PURIFIERS (Feed Water)
Davis Engineering Co.,
90 West St., New York City.
Griscom-Russell Co.,
285 Madison Ave., New York City.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

HEATING EQUIPMENT
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

HEATING STOVES
Stamford Foundry Co.,
Stamford, Conn.

HOISTING ENGINES
Hyde Windlass Co.,
Bath, Me.

HOISTS (Air)
American Shipbuilding Co.,
Foot of W. 54th St.,
Cleveland, O.

HOOPS AND BANDS
Acme Steel Co.,
2840 Archer Ave., Chicago, Ill.

HULLS (Steel)
Ellis Channel System, Inc.,
33 Rector St., New York City.

ICE MACHINES—See REFRIGERATING MACHINERY

INDICATORS (Direction & Revolution)
Sperry Gyroscope Co.,
Brooklyn, N. Y.

INDICATORS (Helm Angle)
Sperry Gyroscope Co.,
Brooklyn, N. Y.

INDICATORS (Speed)
Sperry Gyroscope Co.,
Brooklyn, N. Y.

INSURANCE (Marine)
Boland & Cornelius,
Marine Trust Bldg.,
Buffalo, N. Y.

INTERNAL COMBUSTION ENGINES
Burmeister & Wain,
Maskin-og Skibsbyggeri,
Copenhagen, Denmark.

LAMPS (Mazda and Arc)
General Electric Co.,
Schenectady, N. Y.

LIFEBOATS
Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn, N. Y.

LIFESAVING EQUIPMENT
Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn, N. Y.

LIGHTING EQUIPMENT
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

LOGS (Patent)
Walker, Thomas, & Son, Ltd.,
58 Oxford St.,
Birmingham, England.

LUBRICATING OIL
Texas Co., The,
17 Battery Place, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

MACHINERY (Marine)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Bessemer Engine Co.,
Grove City, Pa.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Chicago Shipbuilding Co.,
So. Chicago, Ill.
Great Lakes Engineering Works,
River Rouge, Mich.
Hoovens-Owen Rentschler Co.,
Hamilton, O.
Manitowoc Ship Building Corp.,
Manitowoc, Wis.
Maryland Dry Dock Co.,
Baltimore Md.
Toledo Shipbuilding Co., Toledo, O.

MACHINISTS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Busch-Sulzer Bros.-Diesel Engine Co., 2nd & Utah Sts.,
St. Louis, Mo.
Hoovens-Owens Rentschler Co.,
Hamilton, O.
New York Shipbuilding Co.,
Camden, N. J.

MANILA OAKUM—See OAKUM (Marine, Rope, Packings, Plumbers)

MARINE DECKING—See DECKING

MARINE ENGINES
Burmeister & Wain,
Maskin-og Skibsbyggeri,
Copenhagen, Denmark

MARINE GLUE
Ferdinand, L. W., & Co.,
152 Kneeland St., Boston, Mass

MARINE GLUE (Liquid)
Ferdinand, L. W., & Co.,
152 Kneeland St., Boston, Mass.

MARINE HARDWARE
Tiebout, W. & J.,
118 Chambers St., New York City

MARINE RAILWAY BUILDERS
Crandall Engineering Co.,
134 Main St., Cambridge, Mass.

MARINE SUPPLIES
Tiebout, W. & J.,
118 Chambers St., New York City

MATERIAL HANDLING EQUIPMENT
Smith, Leathem D., Dock Co.,
Sturgeon Bay, Wis.

MOTOR GENERATOR SETS
Diehl Manufacturing Co.,
Elizabethport, N. J.
Engberg's Electric & Mechanical Works, 2229 Vine St.,
St. Joseph, Mich.
Fairbanks, Morse & Co.,
900 South Wabash Ave.,
Chicago, Ill.
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

MOTORS (Electric)
Diehl Manufacturing Co.,
Elizabethport, N. J.
Engberg's Electrical & Mechanical Works, 2229 Vine St.,
St. Joseph, Mich.
Fairbanks, Morse & Co.,
900 South Wabash Ave.,
Chicago, Ill.
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

MOTORS (Winch)
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

NAUTICAL INSTRUMENTS
Ritchie, E. S., & Sons,
Brookline, Mass.
Sperry Gyroscope Co.,
Brooklyn, N. Y.

NITROGEN (Gas)
Linde Air Products Co.,
30 East 42nd St., New York City

OAKUM (Marine, Rope, Packings, Plumbers)
Stratford, George, Oakum Co.,
165 Cornelison Ave.,
Jersey City, N. J.

OIL BURNING EQUIPMENT
Babcock & Wilcox Co.,
85 Liberty St., New York City.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.

OIL FOR ALL PURPOSES (Marine)
Texas Co., The, 17 Battery Place,
New York City.
Vacuum Oil Co., 61 Broadway,
New York City.

OXYGEN (Gas)
Linde Air Products Co.,
30 East 42nd St., New York City.

PACKING RINGS
American Hammered Piston Ring Co., Baltimore, Md.

PASSENGER SERVICE
Hamburg-American Line,
39 Broadway, New York City.

PIPE (Iron and Steel)
American Spiral Pipe Works,
1440 S. 49th St., Chicago, Ill.

PISTON RING MANUFACTURERS
American Hammered Piston Ring Co., Baltimore, Md.

PLATES (Rolled Zinc)
Hazel-Atlas Glass Co.,
16th & Market St.,
Wheeling, W. Va.

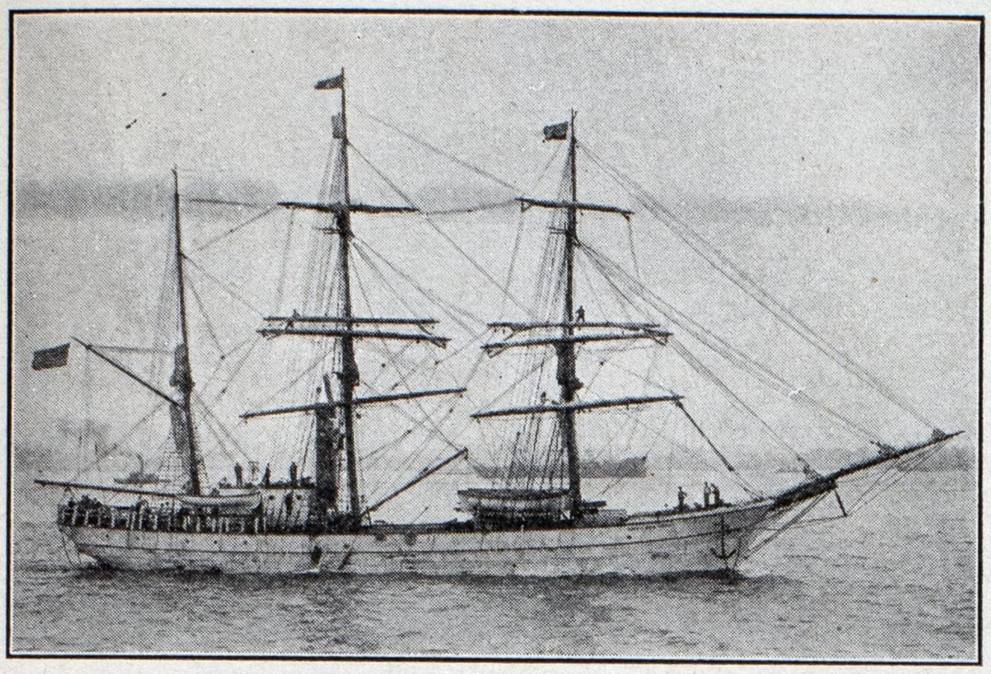
PORT FACILITIES
Newark, Port of
City Hall, Newark, N. J.

PROPELLER BLADES AND HUBS
Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLER WHEELS
American Shipbuilding Co.,
Foot of W. 54th St.,
Cleveland, O.
Detroit Ship Building Co.,
Detroit, Mich.
Great Lakes Engineering Works,
River Rouge, Mich.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
Sheriffs Mfg. Co., Milwaukee, Wis.
Toledo Shipbuilding Co.,
Toledo, O.
Trout, H. G Co., 220 Ohio St.,
Buffalo, N. Y.

PROPELLERS
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Hyde Windlass Co., Bath, Me.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above



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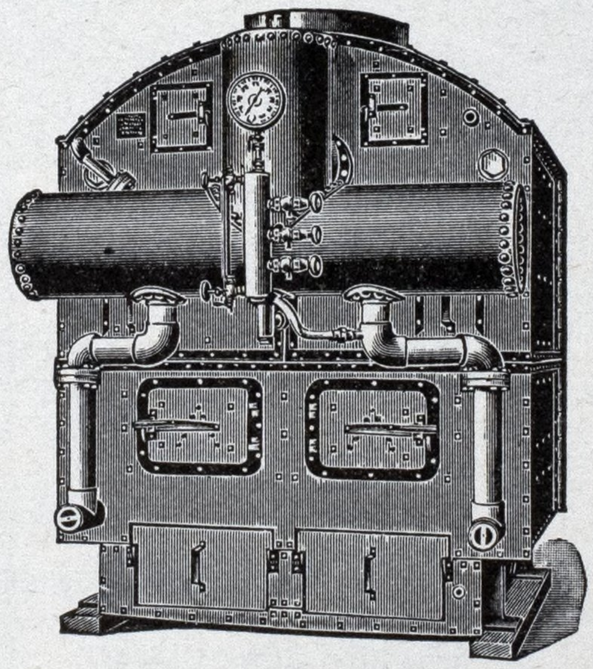
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Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 South Wabash Ave., Chicago, Ill.
Great Lakes Engineering Works, River Rouge, Mich.
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS (Ballast)
Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.

PUMPS (Bilge)
Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 South Wabash Ave., Chicago, Ill.

PUMPS (Boiler Feed)
Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 South Wabash Ave., Chicago, Ill.

PUMPS (Direct Acting)
Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.

PUMPS (Power)
Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 South Wabash Ave., Chicago, Ill.

PUMPS (Steam)
Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.
Fairbanks, Morse & Co., 900 South Wabash Ave., Chicago, Ill.

PUMPS (Vacuum)
Dean Brothers Co., 323 W. Tenth St., Indianapolis, Ind.

PURIFICATION SYSTEMS—See WATER PURIFICATION SYSTEMS

RADIO COMPASS AND DIRECTION FINDER
Radiomarine Corp. of America, 66 Broad St., New York City.

RADIO EQUIPMENT
Radiomarine Corp. of America, 66 Broad St., New York City.

RAFTS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn, N. Y.

RAILWAY DRY DOCKS
Crandall Engineering Co., 134 Main St., Cambridge, Mass.

RANGES
Stamford Foundry Co., Stamford, Conn.

REPAIRS
Maryland Dry Dock Co., Baltimore, Md.

REPAIRS (Electric)
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

REPAIRS (Marine)
American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Chicago Shipbuilding Co., So. Chicago, Ill.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.

REPAIRS (Marine Engines)
Bath Iron Works Corporation, Bath, Maine.
Collingwood Shipyards, Ltd., Collingwood, Ont., Canada
Hooven-Owens Rentschler Co., Hamilton, O.

REPAIRS (Turbine)
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

REVOLUTION COUNTERS
Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.
Sperry Gyroscope Co., Manhattan Bridge Plaza, Brooklyn, N. Y.

ROPE (Manila, Net, Sisal, and Other Hard Fiber Cordage)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston, Mass.
Whitlock Cordage Co., 46 South St., New York City.

ROPE (Transmission)
Columbian Rope Co., Auburn, N. Y.

ROPE OAKUM
Stratford, George, Oakum Co., Jersey City, N. J.

RUBBER TILE
Selby Battersby & Co., 810 Noble St., Philadelphia, Pa.

RUST PREVENTATIVE (Oil)
Texas Co., The, 17 Battery Place, New York City.
Vacuum Oil Co., 61 Broadway, New York City.

SAFETY VALVES (Marine)
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

SCHOONERS (Auxiliary)
American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
Chicago Shipbuilding Co., So. Chicago, Ill.
Toledo Shipbuilding Co., Toledo, O.

SEARCHLIGHTS (High Intensity)
Sperry Gyroscope Co., Brooklyn, N. Y.

SEARCHLIGHTS (Incandescent and Arc)
General Electric Co., Schenectady, N. Y.
Sperry Gyroscope Co., Brooklyn, N. Y.

SELF UNLOADING EQUIPMENT
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.

SEPARATORS (Oil)
Babcock & Wilcox Co., 85 Liberty St., New York City.

SHAFTING COVERING
Paper & Textile Machinery Co., Sandusky, O.

SHIPBUILDERS
American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
Bath Iron Works Corporation, Bath, Maine.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Collingwood Shipyards, Ltd., Collingwood, Ont., Canada.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Maryland Dry Dock Co., Baltimore, Md.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
Toledo Shipbuilding Co., Toledo, O.

SHIPBUILDING SYSTEMS
Isherwood, J. W., 17 Battery Place, New York City.

SHIP CONSTRUCTION (Channel System)
Ellis Channel System, Inc., 33 Rector St., New York City.

SHIP LOGS
Walker, Thomas, & Son, Ltd. 58 Oxford St., Birmingham, England.

SHIP REPAIR (Marine)
Collingwood Shipyards, Ltd., Collingwood, Ont., Canada.

SHIP STABILIZERS
Sperry Gyroscope Co., Brooklyn, N. Y.

SLEEVES (Rubber)
Paper & Textile Machinery Co., Sandusky, O.

SPUN OAKUM
Stratford, George, Oakum Co., Jersey City, N. J.

STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Line, 39 Broadway, New York City.

STEAM GAGES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

STEAM TRAPS
Davis Engineering Co., 90 West St., New York City.

STEEL BARGES—See BARGES (Steel)

STEERING ENGINES
Hyde Windlass Co., Bath, Me.

STEERING GEARS
American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Hyde Windlass Co., Bath, Me.

STORAGE BATTERIES See BATTERIES

STOVES
Stamford Foundry Co., Stamford, Conn.

STRIP STEEL
Acme Steel Co., 2840 Archer Ave., Chicago, Ill.

SWITCHBOARDS
Engberg's Electric & Mechanical Works, 22 Vine St., St. Joseph, Mich.
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TELEMOTORS
Hyde Windlass Co., Bath, Me.

TORSION METERS
Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.

TOWING LINES
Columbian Rope Co., Auburn, N. Y.
Whitlock Cordage Co., 46 South St., New York City.

TRACTORS
Clark Tructractor Co., Battle Creek, Mich.
Lewis-Shepard Co., Watertown Station, 125 Walnut St., Boston, Mass.
Mercury Mfg. Co., 4118 S. Halsted St., Chicago, Ill.
Stuebing Cowan Co., 312 Court St., Cincinnati, O.
Terminal Engineering Corp., 17 Battery Place, New York City.

TRANSMISSION (Rope)—See ROPE (Transmission)

TRUCKS
Clark Tructractor Co., Battle Creek, Mich.
Lewis-Shepard Co., Watertown Station, 125 Walnut St., Boston, Mass.
Mercury Mfg. Co., 4118 S. Halsted St., Chicago, Ill.
Stuebing Cowan Co., 312 Court St., Cincinnati, O.
Terminal Engineering Corp., 17 Battery Place, New York City.

TUBES (Boiler, Stay, Yarrow)
Keating, E. F., Co., 446 Water St., New York City.

TURBINES (Electric)
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Marine)
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Steam)
Da Laval Steam Turbine Co., Trenton, N. J.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TWINE AND ROPE
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston, Mass.
Whitlock Cordage Co., 46 South St., New York City.

VALVE RINGS
American Hammered Piston Ring Co., Baltimore, Md.

VALVES AND FITTINGS
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.

VENTILATING EQUIPMENT
Diehl Manufacturing Co., Elizabethport, N. J.
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.

WAREHOUSE FACILITIES
Newark, Port of City Hall, Newark, N. J.

WATER PURIFICATION SYSTEMS
Griscom-Russell Co., 285 Madison Ave., New York City.

WELDERS (Electric Arc)
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

WELDING AND CUTTING GAS
Prest-O-Lite Co., Inc., 30 East 42nd St., New York City.

WHISTLES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

WINCHES
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WINDLASSES
American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WIRELESS MESSAGE SERVICE
Radiomarine Corp. of America, 66 Broad St., New York City.

WIRELESS SETS AND APPARATUS
Radiomarine Corp. of America, 66 Broad St., New York City.

WORKBOATS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn, N. Y.

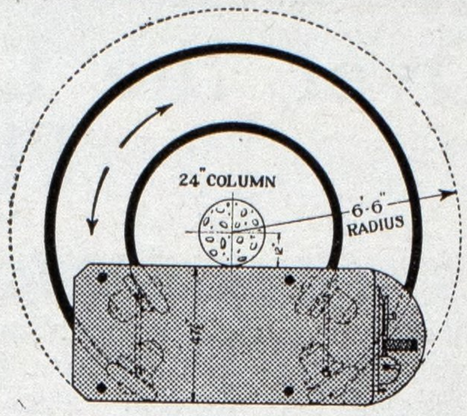
ZINC (Plates Rolled)
Hazel-Atlas Glass Co., 16th & Market St., Wheeling, W. Va.

ZINC PRODUCTS
Hazel-Atlas Glass Co., 16th & Market St., Wheeling, W. Va.

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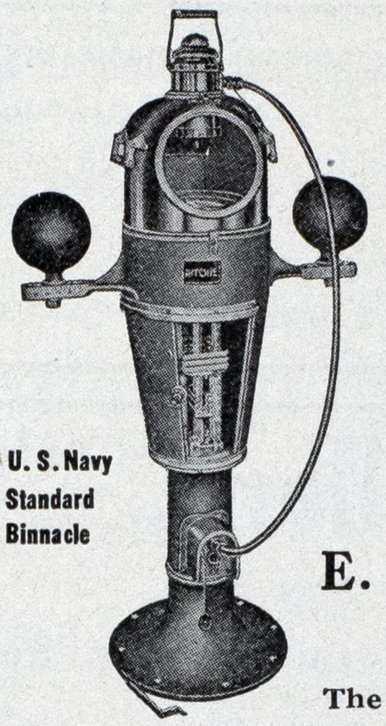
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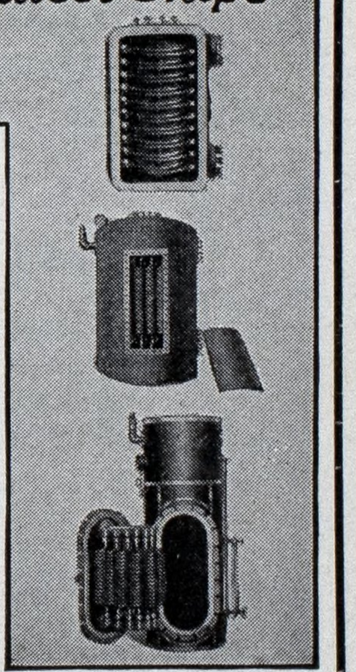


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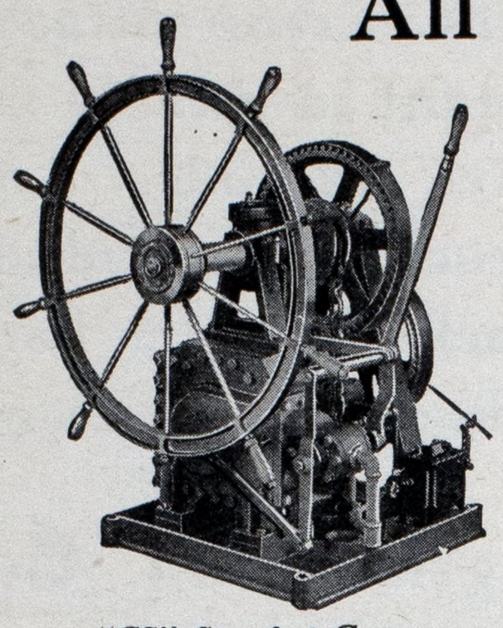
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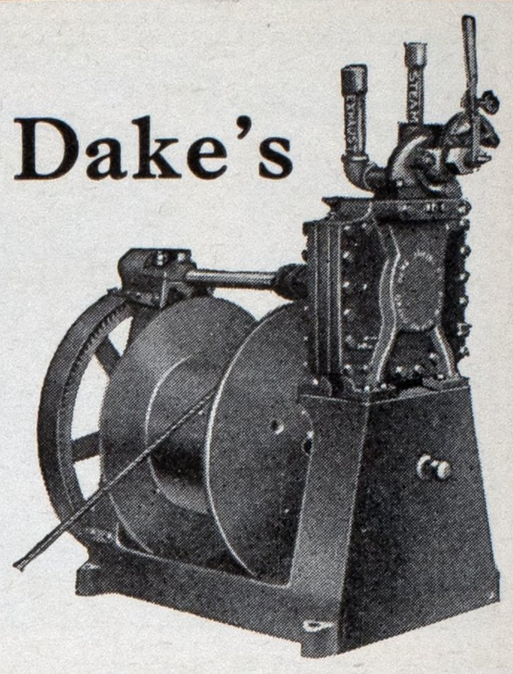


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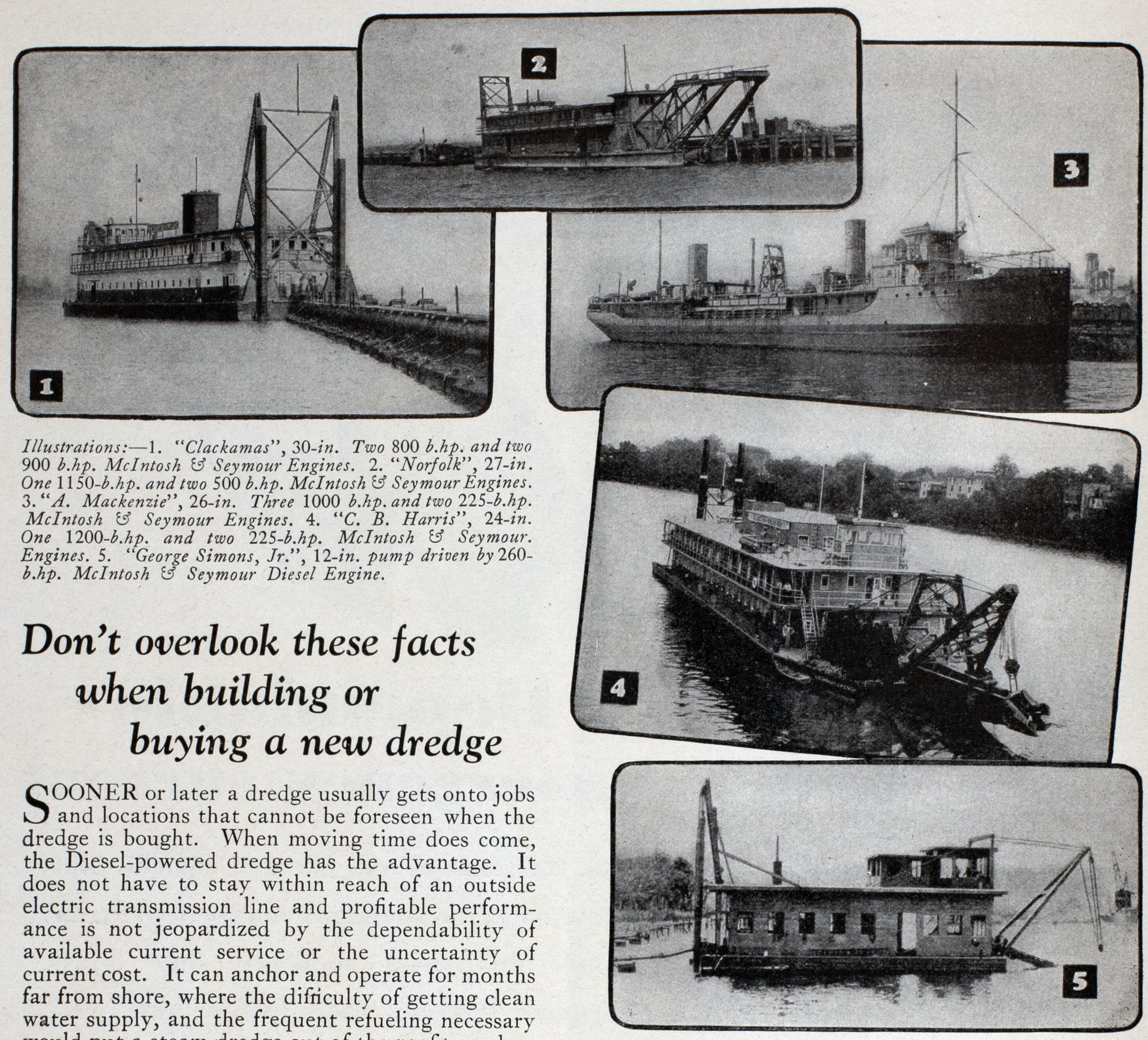
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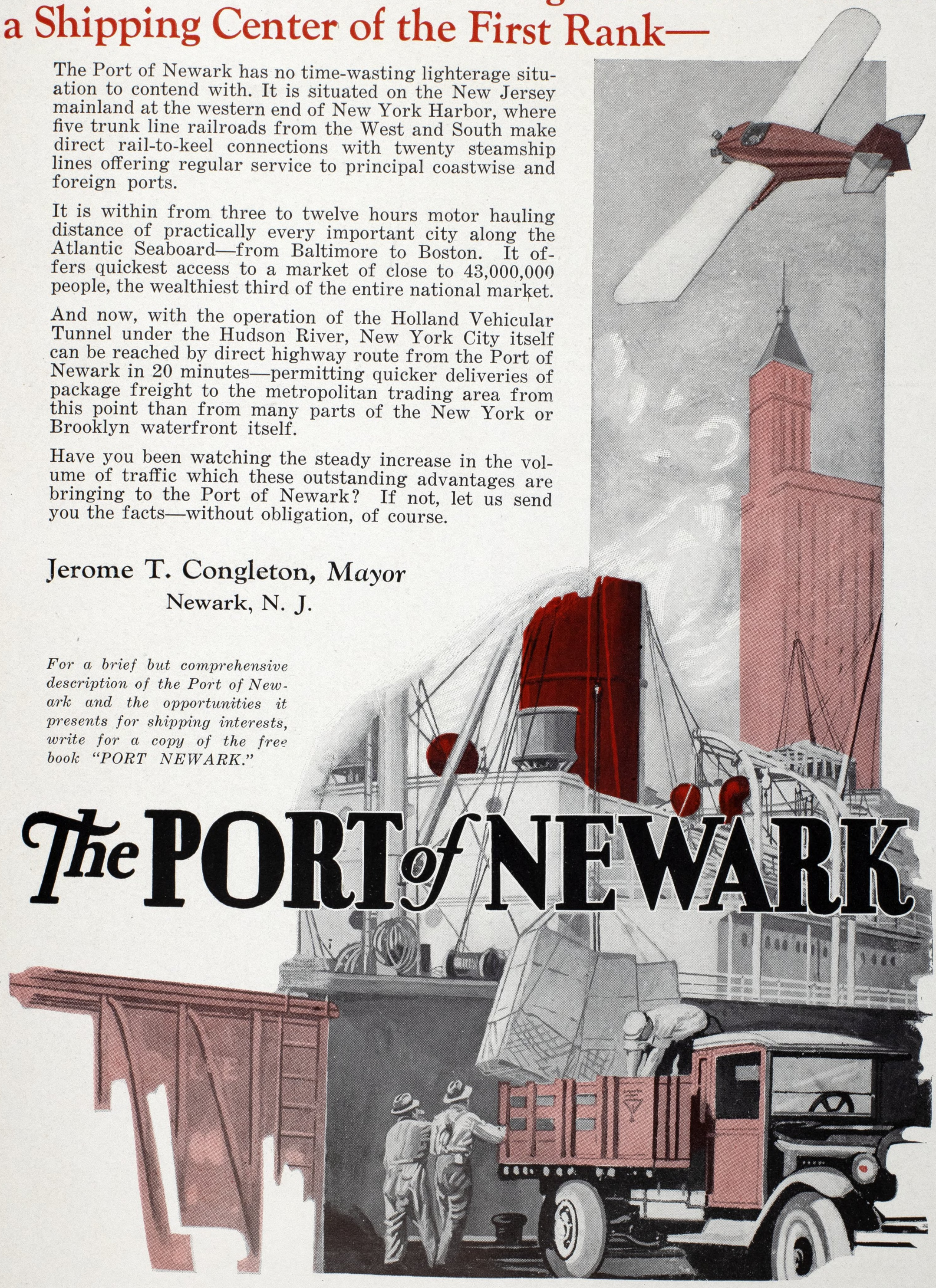
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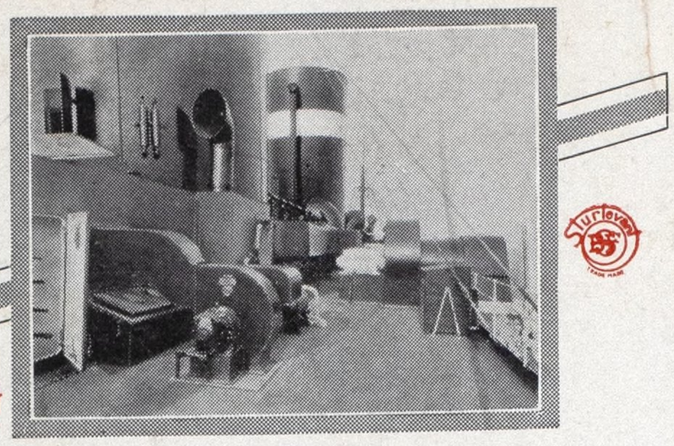
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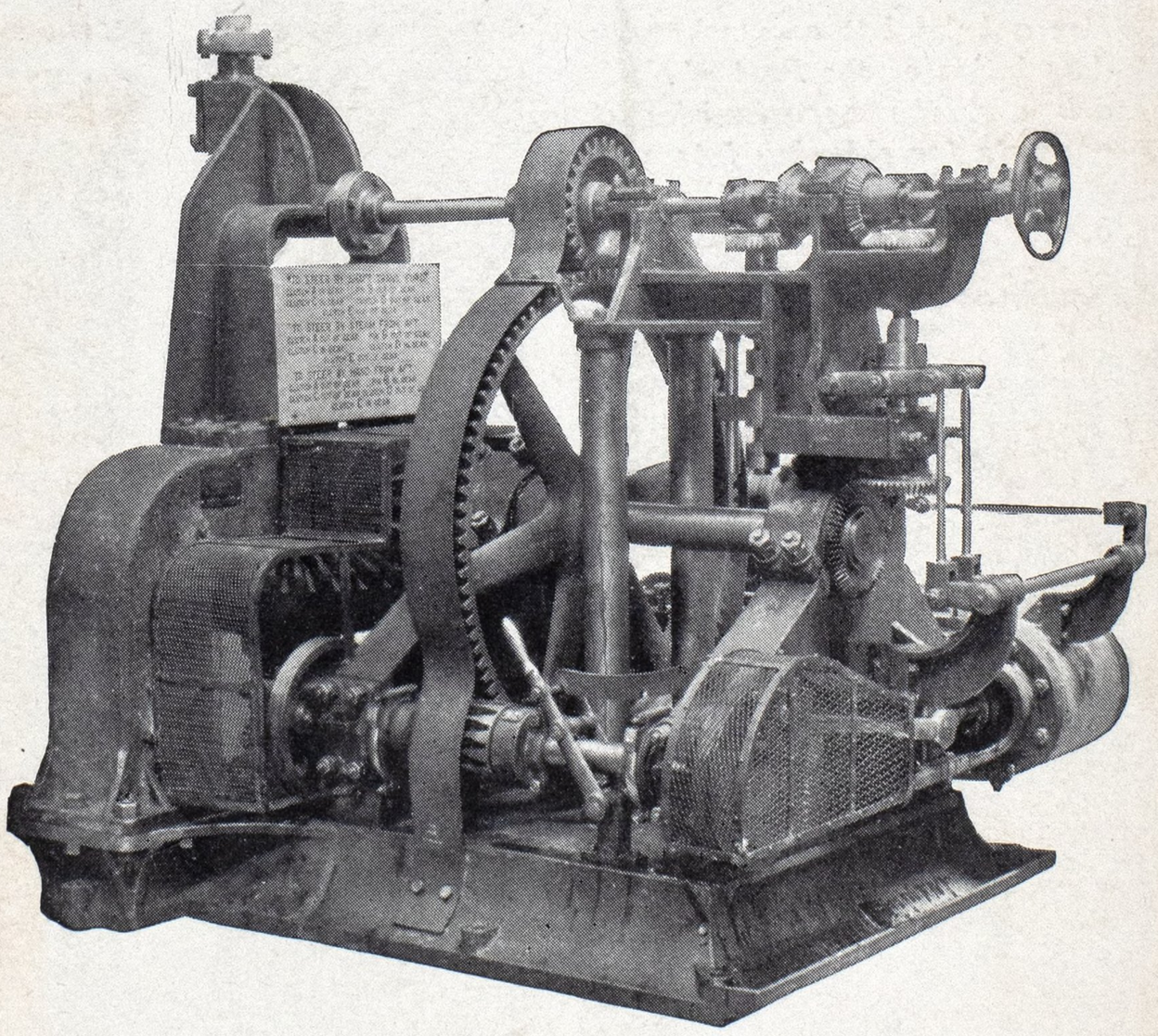
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